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THE EVOLUTION OF THE CONSCIOUS FACULTIES

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THE EVOLUTION

OF THE

CONSCIOUS FACULTIES

BY

J. VARENDONCK, D.Litt., D.Sc.

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INTRODUCTION

THE theory developed in this book is based upon the conclusions reached in my *Psychology of Day-dreams*,[1] which shows how the mind is the seat of abundant ideation without the intervention of either consciousness or will, so that ratiocination is independent of the conscious state. This is a finding that contradicts the teachings of modern psychology, for which consciousness and intelligence are inseparable. "Consciousness, which cannot be disjoined from the notion of the physical self, *is the subjective aspect of intelligence*; it develops together with the latter. Consequently all the facts of intelligence are objective criteria of Consciousness."[2] For Romanes also "Consciousness is the characteristic element of the mind," and the same view is taken by all those psychologists who have adopted the genetic point of view.

It were idle to object that the phantasies analysed in my previous book present, for the most part, mostly poor solutions to the problems which they tend to solve, for invention is only a special case of day-dreaming, as we shall see in the pages devoted to this peculiar mode of ideation.

Day-dreams appear, therefore, to be the intellections of a second self, and their results are adopted by and integrated to the conscious ego whenever they are deemed adequate. The mind may be active and give proofs of intelligence without our being aware of it. This is the capital point.

But it is prudent to define at once what is meant here by intelligence, for in no field of human activity does there

[1] Published by G. Allen & Unwin, Ltd., London. 1921.

[2] Cf. P. HACHET-SOUPLET, *La Genèse des Instincts*, p. 124. Flammarion, Paris. 1912.

prevail such a confusion of terms as in psychology, perhaps because our ignorance in this branch of science is still so great. Often what is simply a recollection of previous experience is called an idea; for us intelligence is synonymous with judgment or choice, either conscious or unconscious; it consists in the *re-association of psychic elements into a new unit.* (New to the individual, for if it were new to the collectivity we should be defining originality.)

The original type of all psychic processes has been reduced by Baldwin and others to the simple cycle: outer excitation—inner process—reaction towards the outer world. I have been able to show that the same stages can be recognized in affective thinking which proceeds without consciousness: the outer excitations are often replaced by memories or affects; the inner process proves to be a concatenation of judgments, of choices; the final motor reaction may take place without awareness or else be postponed. Bearing in mind the "principle of the actual causes," we shall be able to gain much information concerning psychic processes when we come to apply this new knowledge to the animal world, where nearly all behaviour is conditioned by affective thought.

Here again I feel obliged to recall that by affective ideation I understand all thought processes that go on without the intervention of will. It is characterized by the fact that it is the result of the action of emotion upon our psychic apparatus, and it may operate in the conscious as well as in the fore-conscious state. Thus we have seen that we may perceive without becoming aware of the outer object, while the perception is given a special shade or meaning by the affect that is dominant at the moment. Similarly we may recollect, without being conscious of the fact, under the influence of some feeling or other; and all our conceptions are directed by wishes, the phylogenetic predecessors of volition. It is obvious that these affective activities of the human mind will *a priori* allow of a better understanding of the

animal mind, where, just as in our fore-conscious state, the working of the brain depends upon outer circumstances or feelings, or both together ; in other words, on chance and accident. For what is called wish, when considering Man and the higher animals, becomes the tendency to self-preservation, the *élan vital* of Bergson, as we come lower down the scale, so that we possess a factor that will prove one in its reaction upon the mind and in its results, which is another favourable condition from the genetic viewpoint.

When we are deep in a brown study we may be thinking partially or entirely without words, associating sensory images only according to some abstract relations which we bear in mind all the time ; this peculiarity is far from being characteristic of the fore-conscious state only, as I shall be able to establish later on, but it offers us another term for the comparison of human and animal thought. This special feature should not be lost sight of in testing the adequacy of my definition : *A thought is the adaptation of revived memories to a present situation under the influence of affect or will.* I have come to this conclusion from the study of day-dreams, but I hope to bring under the reader's eye sufficient evidence for extending this formula to animal thought as well. For me conception consists in a decomposition of memory and a reassociation of its elements ; and this is likewise true of perception, so that memory is in reality the fundamental factor of the psyche. At every stage of development, where the existence of some sort of memory can be shewn, together with the presence of feeling or affect, there is consequently a possibility of a mental operation. This thesis, for the support of which all available evidence will be adduced, brings us very low down the animal scale, in contradistinction to most psychologists, for whom " intelligence has come very late in the history of living beings . . . it is manifested only in some superior species."

If my theory were admitted, it would allow to explain a great number of facts which at present can

only be attributed to the influence of *natural selection.* Undoubtedly this expression has with many authors lost much of the meaning which was originally attached to it by the great man who invented it ; and it has often been used as a kind of *Deus ex machina* to interpret many as yet inexplicable things ; sometimes it even seems to have been used as a mask for our ignorance. I think I have something better to propose.

Whereas I hold memory to be the basis that supports the whole edifice of the mind, I propose to devote my first pages to it. I shall consider it from a double point of view : memory registers experience as in the sequence of the actual happenings and reproduces it faithfully ; that is what I call *reduplicative memory.* This is an aspect of the subject which most authors seem to have overlooked, whilst others simply alluded to it without giving the attention that is due to this important function. I choose the term *reduplicative memory* to distinguish it from the other aspect which I call *synthetical memory,* a function through which like is spontaneously associated in the mind with like. This aspect of memory is better known than the former and reveals its existence in the process of *perception,* which is based on a dissociation of the contents of the mind. The study of this dissociative process will prepare us for an examination of *conception* as a mental activity which reassociates the elements of our recollections, but makes use herein of the reduplicative memory. Afterwards we shall devote some time to *the unconscious movements* which constitute the externalization of affective thinking ; for if Ribot is right in maintaining that " every idea is a movement that has begun," I shall, on the other hand, lay stress on the point that every movement finds its origin in an idea, at least theoretically. These discussions will procure us the means for elucidating the mystery of *consciousness,* which seems to consist chiefly of an inhibition of movements and ideations of an affective nature and their direction by the will towards deliberately chosen aims.

THE EVOLUTION OF THE CONSCIOUS FACULTIES

CHAPTER I

REDUPLICATIVE MEMORY

Instances of its activity: in day-dreams, neuroses, hysteria, somnambulism, night dreams, in the waking state—We often make use of it unwittingly—Explanation of some strange cases—It is at the root of the preservation of the primitive being, of choice, of anticipation—The law of recurrence as an anticipative process: it leads to the discovery of causal relations—Reduplicative memory constitutes the most primitive aspect of the faculty of retention.

In the course of my study and analysis of day-dreams, which I had succeeded in bringing to consciousness and in recording in the order of their construction by my fancy, it had struck me that every now and then the process of active but undirected concatenation was interrupted and replaced by an invasion of recollections during which the stream of the past flowed by before the mind's eye. I concluded from this that when we relinquish voluntary thinking we pass into a state which is characterized by alternative active and passive attitudes of the mind: in the latter we are idly drifting on the waves of memory, witnessing an automatic rehearsal of the past; in the former, instead of submitting to an uncalled-for recollection, our second self seems, on the contrary, actively searching among our submerged remembrances for an element corresponding to the solution of the problem which it is tackling under the influence of an affect (which I have called affective thinking).

I had thus laid bare two different stages in the fore-conscious state, pointing to a double aspect of memory of which at the time I did not yet grasp the full significance. But I have not ceased thinking about this problem ever since it first puzzled me, and I am now able to submit to the reader a series of facts and observations which will allow us to interpret the two functions of psychic memory.

On behalf of those who did not peruse my *Psychology of Day-dreams*, I shall be allowed to repeat that all our phantasies contain thoughts [1] and pure recollections in different proportions. For the sake of clearness I reproduce one brown study which is not much else but a remembrance from beginning to end :—

I was in a frame of mind favouring absent-mindedness one day when I was sitting in the train from London to Folkestone. Unknowingly I had taken a seat in the wrong half of the train, the half that was going to Sandgate, so that I had to change compartments at a junction on the way.

Strange to say, it was my second self that warned me of my error. I had been reading from London onwards and as I felt a bit tired I had let my book drop for a moment and indulged in a brown study. At a certain moment I noticed vaguely that the train was at rest in a station, and that half the train was being shunted along the opposite side of the platform, until I read with a distracted eye the word "Folkestone" on a board attached to the luggage van on the opposite track. This word caused my mind to drift back to the summer of 1913, when I was spending my holidays on the south-east coast of England, and in a vivid animated picture I went again through some of my experiences of that season. All of a sudden it dawned upon me that the inscription on the luggage van proved that that part of

[1] We should carefully distinguish a thought from a recollection. For me a thought is the adaptation of revived memories to a present situation under the influence of affect or will. When an idea which I have had before comes back to me, I persist, according to my definition, in calling it a recollection. A thought is, as it were, a recollection adapted to a purpose, which gives it the stamp of novelty.

the train was going to Folkestone and not the part that I was in. I had just the time to jump into a carriage that was already on the move, and when I was seated again I traced the happening back as stated above.

As I was now once more comfortably seated and quite unoccupied, my mind strayed in this way: I narrowly escaped arriving in Sandgate instead of in Folkestone. I should have been surprised if I had found my mistake out there only.—But I should not have missed my boat for that.—I should have taken the bus from Sandgate to Folkestone, as I did so often in 1913.—Here a whole series of memories of my sojourn on the south-east coast in that year is revived and flows in pictures before my mental eye.

I see myself sitting in one of the open buses that run along the seashore, as I so often did during my holidays.—I think of the friends that were then my companions and so review a great many events of that time: of our camping and its incidents, of a journey to London in a local train. (Here I make the mental reflection—not visualised but in words: What a silly idea of our London friends to advise us to take that wearisome local train. But I suppose they wanted to gain time to prepare for our reception.) Visual again: But that caused us to leave Folkestone at such an early hour in the morning that we had no time to bid our friends goodbye; and here again I pass through all the incidents of that hurried departure, upon which I awake from my reverie.

This way of going again through past experience is an occurrence that is indeed familiar to all of us, only we are so accustomed to take all our psychic operations for granted that we scarcely ever pay any attention to them until somebody points out their profounder meaning. Only in abnormal cases, of which a few will be cited presently, do we wonder at procedures that nevertheless go on unwittingly and less strikingly in every normal individual. The peculiarity of our mental organ which we are examining here has been taken cleverly advantage of, however, by the manufacturers of cinematographic

films: whenever they want to suggest that some hero of a play is recalling the past, they show him first in a reflective attitude and immediately afterwards project on to the screen, allowing it to appear gradually, through a hazy veil, some event, some part of the film which has been shown before and which the spectators at once understand him to be remembering.

In such a case and in similar ones we speak of reduplicative memory because the mental presentations—sometimes visualised, sometimes not—unroll themselves in the order of their registration; they constitute a faithful replica of the actual experience. So convinced are we of the trustworthiness of this duplicate that when its images occupy our mind we never experience the slightest doubt as to their exactness, as often happens when we try to recollect a name, or a date, or a word, or any element constitutive of what I call the synthetical memory. I use the terms reduplicate and reduplicative also, because not only are the past events revivified with never-failing accuracy, but all the affects that accompanied the experience are reanimated, sometimes in an obsessive fashion, sometimes feebly. Reduplicative memory presents some further features which will become apparent as we proceed with its study.

As a matter of fact, the mental phenomenon which occupies us at present has been observed by many authors, but it will seem that its true meaning has not yet been fully understood. As early as 1872 a French physician, Dr. Mesnet, published his observations of a patient whose skull had been wounded by a rifle bullet, and whose case is simply a variety of what half a century later has been designated as shell-shock. The story of the sergeant of Bazeilles has become classical in French psychological literature. He had been wounded during the attack on the village of Bazeilles, and periodically passed for days into a state of dissociated consciousness. In this condition " he may be walking in the hospital garden under a clump of trees. Somebody puts his walking-stick, which he had dropped a moment before, back into his

hand. He examines it by touch; several times over he feels the crooked handle of the stick, grows attentive, seems to listen intently and suddenly shouts: 'Henry!' Then: 'There they are! There are at least a score of them! Well, the two of us will manage them!' Then, passing his hand behind his back as though to take a cartridge, he performs the movements of loading his chassepot, lies down flat in the grass, his head hidden by the trunk of a tree, in the posture of a skirmisher, and follows, his weapon in the firing position, all the movements of the imaginary enemy, whom he believes he can see at a short distance.—This scene has been reproduced several times." [1]

The main difference between this case and my own memory-drifting in the Folkestone phantasy lies in the fact that the recollections of the sergeant of Bazeilles invade his motor system; he passes from the mental representations to the act. This is probably due to his loss of the conscious state, but the following incident described by W. James himself shows that even normal persons are not immune from such an invasion once they relinquish the advantages of Consciousness: "The writer remembers how, on visiting Paris after ten years' absence, and finding himself in the street in which for one winter he had attended school, he lost himself in a brown study, from which he was awakened by finding himself upon the stairs which led to the apartment in a house many streets away in which he had lived during that earlier period, and to which, on returning from school, his steps had then habitually led."

It would be premature to draw any conclusions from this curious parallel, and we turn back to Binet's observation. We have translated it literally, and he has recorded several similar instances which, for the sake of brevity, we shall not reproduce here. We note, however, that

[1] Cf. Dr. Mesnet, *De l'automatisme de la mémoire et du souvenir dans le somnambulisme pathologique* (Union Médicale, 21 et 23 juillet 1874), cited by A. Binet, *Les Altérations de la personnalité*, p. 44, Alcan, Paris. 1892.

he does not attempt to offer any explanation of this strange phenomenon.

The literature of hysteria abounds in instances of patients who are obsessed by their reduplicative memory, and it may be said that the worst cases are those in which the sufferers lose control over their muscular system. P. Janet has published two volumes [1] in which he examines the actions of hysterical patients in the dissociated state and their behaviour under hypnosis. It will further become apparent that he does not make a clear distinction between the spontaneous manifestations of memory in his patients and those due to the influence of his suggestions, of imitation, of contagion, or of their own unconscious ideation, but for our present purpose it will suffice to cite a single one of his numerous observations :—

" For several months Marcelle has been suffering from a crisis of visual hallucination which is much more important and more characteristic. About six months ago, during a short walk away from the hospital, she witnessed a very painful scene which made the deepest impression upon her.

" Discretion prevents us from giving a detailed description of it. Ever since Marcelle sees in her cloudy crises (the patient said ' it was as though she was living then in a continuous cloud ') *the scene reproduces itself exactly with the same details* (my italics) ; the same surroundings, the same persons, the same attitudes ; everything is a faithful repetition, and the poor sufferer remains for days absorbed in this painful contemplation." Janet's verdict : " During the hysterical crisis the origin of the lascivious attitudes seems to be internal, in the remembrances of the patient," agrees fully with the broader conclusion of Freud, for whom " all hysterics suffer from reminiscences." It would seem that if distorted, veiled and concealed memories are taken into account this diagnosis may be applied to a much greater variety of mental diseases.

We return to the instances of unconsciously acted

[1] Cf. P. Janet, *L'Automatisme psychologique*, 2e édition, Alcan, Paris. 1894 ; and *Névroses et Idées fixes* (2 vol.), Alcan, Paris. 1898.

recollections with the mention of the patient whose case is recorded by Breuer and Freud in their *Studien über Hysterie*: Anna O. lived alternately in two different states of Consciousness. In the first (her normal) condition she was living, like other people, in the winter of 1881–82; but when she was in the state of auto-hypnosis or "absent-mindedness" she was living the winter of 1880–81 over again, and all that had happened since was forgotten. . . . The regression into the past year occurred so intensively that she hallucinated her old room in their new house, and when she wanted to go to the door she knocked against the fireplace, which occupied, in relation to the window, the same position as the entrance-door in her old home. The passage from one state to the other occurred spontaneously, but could be provoked with the greatest facility through any indifferent sensation that vividly recalled the previous year."[1]

We are quite aware of the fact that we are dealing with exceptional cases in which normal Consciousness is impaired by disease, but we repeat, after Cl. Bernard, "The exceptions, the anomalies, the exaggerations in psychology, as in astronomy, in physics, in chemistry, in biology, etc. . . . put us in the way of discoveries, because they reveal or render perceptible the action of unknown factors; they facilitate the investigation which will lead to the unravelling of these factors. Where there is a paradox, there is a discovery to make."

Reduplicative memory may become manifest also in the conduct of somnambulists whose actions are not always conceived during their sleep as their execution proceeds. Jastrow[2] gives an example of this which leaves no room for discussion: "I will take the case of G., a young woman left in charge of the household during her mother's absence. Owing to the preparation of a late supper and interruption on the part of visitors, she

[1] Cf. J. Breuer and S. Freud, *Studien über Hysterie*, p. 25, 3e Auflage, Deuticke, Leipzig. 1916.

[2] Cf. J. Jastrow, *The Subconscious*, p. 205, A. Constable & Co. London. 1906.

was engaged as late as ten o'clock in washing dishes and in laying the table for breakfast. In the middle of the night she was found by her father re-washing these same dishes in her sleep; and in reply to his questions she urged that she wanted her mother to find everything in order upon her return. The next morning she retained no memory of her dream-activity."

As the author of this essay has never recorded and analysed a single day-dream which did not contain in its texture at least several examples of passive memory-drifting, it may be supposed that in night dreams also the past may be partially reproduced before the mental eye without alteration. This state of affairs seems to be realised in a dream of Jastrow's which we find recorded in the same volume (pp. 227–8).

"In settling myself to sleep, I saw against the dark but luminous background of my closed eyes a very distinct picture of a street, with a line of ancient wall expanding at frequent intervals into battlemented towers. I felt convinced that the picture showed me something that I had actually seen; and, as I followed its development, I was presently confronted by a ruined Roman arch. I awaited further fragments, and soon found myself viewing a river spanned by a picturesque bridge; then I deliberately followed the course of the river and caught glimpses of the opposite shore, of the old houses on the town side, of narrow streets and carved archways, of an early Gothic church, enclosing in one of its external arches a composition in stone,—a group of curiously sculptured figures,—set low, and very dusty with accumulated dirt; all still unidentified. I then wandered back to the main avenue, and in a large square fronting thereon I saw the statue of a French statesman whose features I knew, but whose name for the moment refused to recur; and I then entered a book-shop near by. There I found the clue to the whole series, hitherto merely the dissociated scenes of a traveller's recollections, probably through the labelled photographs there displayed; for I seemed suddenly to realise that the town was Cahors, my whole

acquaintance with which was a seven hours' sojourn six months previously."

I do not believe that the part taken by the reduplicative memory in the construction of dreams has often been examined before from our special point of view, and it has become impossible, since Professor Jastrow is dead, to ascertain whether I should be justified in concluding that his dream exemplifies the occurrence of automatic reproductions in the course of the dream formation; although this is highly probable. Still, my personal experience points that way, and this opinion is supported by the knowledge which has been gained as a result of the war-neuroses. Thus I read in the report of a meeting held on November 11th of last year by the British Psycho-analytical Society: "A discussion took place on War or Battle Dreams, with special reference to the content of the dream in as far as it was *an exact replica of an actual experience*, and also its relation to the pathogenic trauma.

"Dr. Wright said that in the cases which he had examined soon after the patients' return from the front the *war dreams were frequently repetitions of pure experiences*, but after a while these had indifferent matter added to them."[1] (My italics.)

I notice that none of the other members who took part in this discussion—and all were competent men—took objection to this statement, the only difference between Dr. Wright and other speakers bearing upon the proportion of these dreams as compared with others, in which reality reappears in a modified form, a point which does not interest us here. Therefore I am inclined to conclude that at least in some dreams the reduplicative memory unrolls the film of the past before the mind's eye. And this is quite in agreement with the revivification of the reduplicative memory in waking life, where it also happens—at least with normal persons—shortly after the actual experience only. This is an observation which anyone can make in respect of himself, especially after an event that has made a strong appeal to his feelings.

[1] Cf. *The International Journal of Psycho-Analysis*, 1/3, 1920, p. 363.

I chose from among my self-studies this instance: I had delivered a lecture in Antwerp and I had met with a certain success, a fact which explains the sequel. I had been set the task of inducing my audience to undertake the duty of personal canvassing in favour of a certain institution for which I have a great deal of sympathy, and I had reasons to believe that my arguments had gone home. After the meeting I went to a restaurant to have dinner with some friends, but all the time the recollection of the lecture obsessed me: I delivered it a second and third time mentally; or at least the passages with which I felt most satisfied. Later on, as I sat in the train, I inwardly heard myself speaking again, but this time I noticed that I had interrupted my involuntary reminiscence in order to improve on my first delivery; I hit upon a new argument, a new metaphor, of which I promised to take advantage on some future occasion. In the forenoon and also in the afternoon of the next day my speech still obtruded itself on my mind; I saw the audience once more, and all the different incidents of the proceedings; the mover and seconder of the vote of thanks; I heard again the congratulations of the president, etc. But the text of my speech itself (which I had not written out) left me more at peace. I shall not maintain that a strict chronological order was observed in these importunate recollections. The second day after my journey to Antwerp the remembrances of my Sunday experiences came only to me in a sporadic way, at longer intervals, and I could quite easily repress them. The third day they did not reappear any more. We shall note that, whereas the running off the reel during dinner and in the train produced images so vivid as to make me absent-minded during conversation and on reading the newspaper, the next day it was only when my thoughts were not directed that this sort of obsession came back, while afterwards the process of recollecting was distinctly incomplete, and quite liable to be suppressed. We conclude from these observations that reduplicative memory is common in mental health and in disease. It

may manifest itself without any outer excitation and may irresistibly unfold itself. But when it happens in normal individuals it makes them temporarily unfit for their ordinary conscious pursuits, or at least considerably diminishes the productivity of their conscious mental powers.

I wish to insist a moment longer upon this automatical revivification of memory, for this is one of its aspects which has slightly been neglected by modern psychologists. Heaps of books have been published and hundreds of experiments undertaken to find out in which conditions some data may be retained and some of these *recalled* voluntarily. But nobody seems to have deemed worthy of attention the fact that the mind registers without the intervention of volition and that some remembrances come back again *uncalled for*, nay, when we should better like not to recollect at all: for the past obsesses us sometimes notwithstanding our endeavour to forget it. Reduplicative memory as manifested under normal conditions has not yet, it appears, been the object of scientific investigation. I myself take it to be a primitive form of memory which may be retraced through the whole series of organisms, as will soon be shown.

But beside the reduplicative recollections, which return to us without any apparent solicitation, we do not fail to utilise this innate faculty on occasion in view of our conscious mental activity: we are then said to take advantage of our "memory by contiguity," only we are not aware of doing so; in any case this point will be discussed at length elsewhere. But I shall at the same time demonstrate that the animal also does it, that it has equally the spontaneous use of its reduplicative memory.

After having thus marked out our ground we shall proceed, first passing in review some examples of the conscious utilisation of the reduplicative memory. The first is cited by Jastrow, who borrowed it from Mercier; it is remarkable because we see how the author recurs successively to the other form of his memory when he

is unsuccessful with the one he is using. (A comparison between reduplicative and synthetical memory will follow in the next chapter.)

" In going through a greenhouse yesterday I encountered a vegetable joke in the shape of a curious cactus. Immediately I saw it I was reminded of a similar one that I once saw in the Duke of Devonshire's garden at Chatsworth. It stood upon a bed of broken stone, on the right-hand side of the hot-house as I passed through. There was a *Plumbago capensis* trained to the rafter above. A. and B. and C. were of the party, and I remember that B. asked me the name of the plant. Dear me, what was the name? A very happy day that was. We drove from Buxton. I don't remember that part of the drive, except that old D. told us twice in the course of it his old story of the witness and the judge. But I remember very well the 'Peacock' at Rowsley, for I had been there before, and I remember the drive through the meadows by Haddon Hall to Blakewell. Ah, yes! in the inn yard at Blakewell there was a cat torturing a mouse, and I remember how indignant I was with the brute. Odd that I should recollect a little incident like that, when I cannot remember the name of the cactus! What was that name? Poor old D. He is dead now. How cold it was when we started from Euston to go to his funeral, and E. dropped his umbrella between the train and the platform. The name of the cactus! It began with a 'C'—or was it a 'G'? And it had an 'm' in the middle, or at any rate it had no letter with a head or tail, and I think it ended with 's.'—Cinereus? No. Gamens? No. Stay, had it not something to do with wax? or was it that there was a *Hoya farnosa* close by? No, there is some flavour, some suspicion of wax or bees about it. Ap—no, it began with a C. Cim—Cam—Cer—Ceraceus—Cereus! That was it! Of course! Cereus, and hence the suggestion of wax—cera. Such were the rambling memories brought up in my mind by the sight of the cactus."

It is obvious that the first association aroused was a

visual one, *a complete picture* in which even a temporal sequence is noticeable. Later on I shall return to the kind of artifice we use, on trying to recall the accessory circumstances of a past experience, when synthetical memory leaves us in the lurch. It will then be shown that we recur to reduplicative memory when our synthetical memory is incapable of helping us out of a difficulty.

Education turns to profit the automatic character of reduplicative memory when it sets the pupil the task of learning by heart a piece of poetry or a passage of prose, which can be reproduced in its natural sequence. It does the same in the memorisation of the tables of multiplication, the conjugations and declensions in foreign languages, and other similar instances.

But in the last cases, as well as in the use of mnemonics, it aims in the act of *recalling* not at obtaining a replica for its own sake, but only as a means of arriving at a very quick decomposition of a paradigm ; in other words, it starts from reduplicative memory to finish with synthetical memory, a mechanism which will be examined and commented upon later on. Education has thus been led to adopt in an empirical manner a procedure which may be detected in nature, when one follows the evolution of memory throughout the animal kingdom.

Unwittingly also we have recourse to what I take to be the most primitive form of memory when, in order to find the refrain of a song, we have to repeat (mentally or aloud) the whole verse ; or when we have to recite all the part of poem or test that precedes the passage which we want to recall. In these and in similar instances we revert to a procedure that has a profound meaning for the history of the mind.

It is thanks to his reduplicative memory that the celebrated calculator Diamandi, who a few years ago was examined by many a Continental psychologist, is able to astonish his audience by reciting, at the end of the performance, the complete list of all the arithmetical operations he has made, from first to last. All persons

do not visualise so easily as Diamandi, of course, but special circumstances, always of an affective nature, may arise and render any mind able to take advantage of this peculiarity of our psychic endowment. In such a case they see with the mind's eye the contents of their memories as they are successively reawakened, but this turning inward is invariably accompanied by a weakening of the functions of Consciousness. (I shall further argue that theoretically we lose Consciousness for the duration of any recollection.) I insist upon it that in the following cases the unrolling of the memory-film is accompanied by visualisation :—

Mr. Abercrombie is personally acquainted with "a distinguished actor who, being called upon to replace one of his colleagues, who had suddenly become ill, had to learn a long and difficult rôle in a few hours. He learned it very quickly and played it with perfect exactitude. But directly after the performance he had forgotten it to such an extent that, as he had to play the rôle several days in succession, he was each time obliged to prepare himself anew, not having had as he expressed it the time to study it. On being asked by me what mental process he followed after he had played his rôle for the first time, he replied that he had completely lost sight of the audience, that he seemed only *to have the pages of his part before his eyes* (my italics), and that if anything whatever had interrupted this illusion he would have been brought to a standstill instantly." [1]

I had not yet heard of this case when I reported in my *Psychology of Day-dreams* the following observation, which resembles it completely :

The other day I had in an official capacity to deliver a speech in my quality of chairman of a society of discharged soldiers. As I knew that our premier and several other highly-placed personages would speak at the same meeting before me, I took the precaution to write my speech down, for I wanted to be caustic without

[1] Cf. ABERCROMBIE, *Essay on Intellectual Powers*, cited by TH. RIBOT in *les Maladies de la Mémoire*, Ballière, Paris. 1881.

exaggeration, and my vanity would not allow me to show myself too inferior to the parliamentary orators who would captivate the first attention of the audience. However, I did not make any effort to memorise my notes, because I knew that it would suffice that I had written them down to have those rhetorical niceties at my disposal just when I wanted them.

When half a dozen speeches had been delivered before a well-disposed audience my turn came, and as I appeared on the platform I was greeted by an ovation. This agreeable surprise was due to the circumstance that I had put on my old uniform for the occasion : a patriotic manifestation in honour of a war hero. For me personally this ovation had an unexpected result : I never delivered a speech with greater ease. After every sentence almost an enthusiastic outburst of applause came to interrupt me and during every interruption I visualised my written notes, so that I had the hallucination of the paper I had written it on. I literally re-read it from memory; I repeated it faithfully to the audience as I had composed it. In the meantime I was absolutely not aware of my tremendous success, as my fore-conscious attention was directed exclusively to my visualised recollection ; only I felt very nervous and could not stop my right leg from flexing and extending itself very quickly, almost with a vibratory movement. I scarcely noted the loudly expressed applause, and whereas I can usually distinguish every single face in the audience, and easily recognise my friends, this time I did not see any face whatever, nor did I think of looking for them. I was absent-minded, if I may say so, for everything but the reproduction of *the text which I hallucinated before my eyes.*

It has now become clear to me that on this occasion I was so fortunate as to obtain the unexpected help of my reduplicative memory, and I clung to the visualised text as did the actor mentioned by Abercrombie. This explains, too, the complete inability to observe the audience in both cases; Conscious perception was impaired because the memory was active reduplicatively and was not

available for synthetical operations. (I shall show in the next chapter that every perception is a synthesis in which the elements furnished by memory are more numerous than those furnished by sensation. This will further enable us to realise that Consciousness consists simply in the free disposal of memory.) In the meantime we already are able to understand certain phenomena that have puzzled many others before us. Indeed, the absent-mindedness in both these cases recalls in a singular degree that which is characteristic of the "second condition" in the cases of dissociated personality, as in hysteria and other psychoses; the patients also are absorbed in their thoughts; their attention is turned inwards and they are insensible to their surroundings, to which they do not respond, in a degree which varies from a "narrowing of the psychic field" to a complete absence of consideration for external sensations.

We can now imagine what is going on in the minds of patients who are subjected to such experiments as the following: "The sergeant of Bazeilles, during a crisis, . . . had taken a writing-pad containing about a dozen sheets. He was writing on the first page when the idea came to us to take it suddenly away; his pen continued to write on the second sheet as though he had not noticed the abstraction which we had performed, and he finished his sentence without stopping, without any other expression than a slight movement of surprise. When he had written ten words on the second sheet we took it away, like the first; he continued on the third sheet the line which he had commenced on the second, exactly at the point where he had lifted his pen. In the same manner we took away the third sheet, and then the fourth; and on coming to the fifth sheet he signed his name at the bottom of the page, whereas all that he had written had disappeared with the preceding sheets. Then we saw him direct his gaze towards the top of the blank page, re-read all that he had written down, with a movement of the lips marking each word, and then several times over trace with his pen, at several points of the blank page, here a

comma, there an *e*, and further down a *t*, following attentively the orthography of every word which he endeavoured to correct to the best of his ability; and every single one of his corrections corresponded with a mis-spelt word which we found at the same height on the page and at the same distance from the margin of the sheets which we had in our hands."[1] Mesnet's experiment has been often repeated with hysterics, and always with the same result.

I think there will be no doubt left in the reader's mind that we are confronted with a case of reduplicative memory comparable to those which we considered above. Either the whole procedure is merely a repetition of a letter written by the patient on some former occasion, in which case the text of the letter would have existed beforehand in the writer's memory—but the description here given does not allow us to form any opinion as to whether this was so; or his memory registered the writing as it flowed from his pen and clung with fascinated attention to this image, which allowed him to proceed in the strange way described above. But in any case the entrance into play of his reduplicative memory is beyond dispute.[2]

[1] Cf. A. BINET, *Les Altérations de la Personnalité*, pp. 47–48, *op. cit.*

[2] Such is the explanation, I think, of the analogous cases which abound in psychological literature. Only two of these will be quoted here as examples. In the book from which I borrowed the description of the strange behaviour of the sergeant of Bazeilles, BINET cites the following: "When he comes to his bed, the patient takes from his wash table his comb and his looking-glass; he combs his hair, brushes his beard, arranges his collar, opens his waistcoat; in short, proceeds with care to all the details of his toilet. M. Maurice turns his looking-glass back to front, but the sergeant nevertheless continues his toilet, looking at himself in the mirror which no longer reflects any image." There can be no doubt that the poor man is guided by his reduplicative memory. He acts much as would do any hypothetical primitive creature, whose mental equipment should consist only of reduplicative memory; that is, it would only be able to react in the presence of external circumstances absolutely identical with those already familiar to him. The same applies to the case mentioned by GRASSET: "I have often cited the story of a general paralytic who continually lost his bearings in the streets of Montpellier, especially if he sought to find it by means of O (that is, his consciousness); but who used to return home automatically with his polygon (that is, fore-consciously) if he gave another occupation to the remains of his O, and returned home without voluntarily thinking

We shall further remark that the patient seems to possess during this operation a power which is denied to most normal persons who chance to take advantage of the same procedure: he is, namely, capable of throwing a regressive glance over the contents of his reduplicative memory, of bringing the film to the light over and over again, automatically as it were; normally this is quite impossible. The patient is still the victim of his reduplicative memory suffering its revival in his own person.

The knowledge won from the foregoing observations allows us to give the explanation of a mental artifice which is probably common to all. When I am reading a book it may happen that I stray from the text and become absorbed in some subsidiary matter, only to interrupt the concatenation; for on resuming my reading a little later I am very soon off the track again, owing to an intuition that the idea which I had entertained distractedly a few moments before might come in useful for my work. Alas! I cannot recall it. But instead of giving up any further attempts, I pick up my book again and read a few sentences previous to the place at which I went wool-gathering. I try to assume the same mental attitude as before and the strategem often succeeds: I am often able to bring to my Consciousness the affective idea which had been formed involuntarily and which stubbornly refused to return by the usual procedure. It is obvious that this is another instance in which reduplicative memory proves useful.

The attention which is spontaneously aroused in favour of reduplicative memory as soon as it is reawakened by an external or internal excitation, and which diminishes the power of conscious attention in proportion as it is feeble or not, gives us the key to the understanding of the fact that we have a keener eye for the orthographical

about the matter. BERNHEIM has published a similar case of a patient who was incapable of remembering the topography of the streets and squares of Nancy, not knowing what monuments stand in the Place Stanislas, yet who nevertheless found his way home." (*Contribution à l'étude de l'aphasie et de la cecité pr. des ch.*, Revue de Médecine, 1883, p. 625.) I shall return to the subject in the chapter on Consciousness.

mistakes of others than for our own. Whenever we re-read a text which we ourselves have written we cannot prevent reduplicative memory from becoming active (it often takes us through the text more rapidly than our physical sight). It absorbs part of our conscious attention ; we read what we see in the mind's eye ; we become absorbed by the content thus read instead of the page before us ; we overlook the actual spelling on the paper. But as reduplicative memory cannot come into play when we read another's composition for the first time, our conscious attention is able to wield its full power, and our critical faculties are uncorrupted. The same mechanism explains why the repeated correction of proofs is so exhausting for an author that he requires outside help.

The reduplicative memory and the ease wherewith it seems to make connection with the motor system will probably also explain how it comes that stammerers cease to stammer in singing, and are in some degree free of their defect during recitation. When they are able to abandon themselves to the stream of reduplicative memory they are no longer forced to think of their pronunciation ; on the contrary, they are unable to do so to the same extent as before, since their attention is attracted by the images of the past. And we know that generally their stammering arises from the fact that their conscious attention tries to interfere with the contractions of their organs of speech, which normally are directed by the unconscious. They become unconscious of the use of that part of their muscular system which is called into action in singing or reciting, and for the time become normal.

Certain reactions mentioned by Professor Bergson may also be explained by the preservation of an intact reduplicative memory, whereas synthetical memory no longer does its work normally : " One has seen insane persons who gave intelligent answers to questions which they did not understand. In this case the function of *speech* reacted as a reflex. Aphasics, incapable of pronouncing spontaneously a single word, recall without an

error the words of a melody if asked to sing. Or they will recite fluently a prayer, or the series of the numbers, or the days of the week, or the months of the year. Thus mechanisms of extreme complexity, subtle enough to imitate intelligence, may operate of themselves once they have been constructed. . . ." [1]

From this passage, and others given above, it results that reduplicative memory is independent of the comprehension of the data registered at every stage of mental evolution. (Choir boys, reciting Latin texts which they have not assimilated, offer a simple example of what I mean by registering without comprehension.) There is only one exception to this rule: namely, when the use of this form of memory is only a means to an end, as in the case of children who memorise a multiplication table or a piece of poetry which has been explained to them. Moreover, whereas normally we do not even suspect the existence of reduplicative memory, to say nothing of the use which we make of it, this feature is really common to all our mental operations, unless our attention has been especially directed to their mechanism. What I wish to emphasise here is the *automatism* which is characteristic of this regression of the past, of this mental invasion as it were.

Therefore I reproduce here three short observations which I have already published elsewhere, for they are quite to the point:

(*a*) I am in bed, trying to fall asleep. I hear the church-bell strike the hour, and I decide to count the strokes, for I am afraid my phantasies have again kept me awake so long that I shall feel tired to-morrow morning. Almost simultaneously with my decision to count, an idea flashes through my mind relating to an event which occurred in 1914. A few seconds later I become aware that I am counting "1919, 1920, 1921," instead of "8, 9, 10," etc., which points to a compromise between the two thoughts, or rather between reduplicative memory

[1] Cf. H. BERGSON, *Matière et Mémoire*, p. 84, Alcan, Paris, 13e édition.

and the recollected date. The automatism is still more apparent in the following observation

(*b*) In numbering the pages of my diary I always write the number twice, once on the right and once on the left, at the top of every page. Before my attention had been aroused by the peculiarity which we are at present examining, it had often happened that when I had written a number in the left-hand top corner, I wrote the following number instead of that already written on the right-hand. On a later occasion I was able to observe that this mistake occurred whenever I thought of something other than the numbering. My hand wrote under the direction of reduplicative memory.

(*c*) Something similar happened when on a certain day I found that the clock on the mantelpiece of my study had stopped because I had forgotten to wind it up. The hands showed one o'clock, and I had to advance them to a quarter to nine; but after every half hour I had to interrupt the turning movement in order to let the clock strike. At a certain moment I lapsed into a day-dream, and when I awoke from it the clock was just striking twelve. Reduplicative memory again had had free play and had taken advantage of my distraction. As I counted the strokes in my absence of mind I had automatically continued to count, "nine, ten, eleven, twelve," after I had come to "eight."

All the observations which have so far been reported prove that when the degree of consciousness diminished, either as a result of voluntary renouncement, as when we abandon the attempt at adaptation to the outer world (as on preparing for sleep, for instance), or in the waking state by a preponderance of affective ideations (as in a state of distraction), or in the somnambulistic state, or in certain diseases: in every one of these cases of weakened resistance reduplicative memory manifests itself in a spontaneous, automatic and irresistible manner. This leads to the conclusion that there exists close relation between the state of consciousness and the revivification of reduplicative memory. The same features will be

discovered if we examine the ways in which those animals react whose consciousness becomes manifest only every now and then, and as circumstances provoke it.[1]

The moment has come to inquire what is the meaning of reduplicative memory from the phylogenetic point of view. We shall obtain the reply from the observation of animal psychism as well as from the examination of the mental processes in Man.

A remarkable case of reduplicative memory in animals was communicated by Darwin half a century ago. "Many years ago I happened to take a stage-coach; the coachman stopped in front of the first inn for a minute or so. When we arrived at the second inn he did just the same, and I then asked him for the reason of this behaviour. He pointed to one of the horses and said that it had been blind for a long time and that it stopped at every place on the road where it used to halt formerly. Experience had taught him that he lost less time in letting the carriage stop than if he tried to get the horse past the place without a halt; for it was satisfied with a momentary halt. Hereafter I observed the animal, and it was clear that before the driver and the other horses halted it knew exactly where every inn was along the road, for it pulled up a little before the others."[2]

W. James also cites some cases which are worth recalling. He, however, uses the word habit where I recognise a manifestation of reduplicative memory. This might involve us in a discussion of the difference between these

[1] For the sake of comparison and in anticipation of further discussions I reproduce here a remark of HACHET-SOUPLET's: "I have known dogs trained to dance to perfection, disguised as Loie Fuller, under the spotlight. If at rehearsal practical jokers called to them from the wings before the lights were switched off, while they were still under the influence of their trainer, they uttered cries of anguish while continuing their dance. . . . They could not help performing their exercises in proper succession, notwithstanding their desire to answer the call." Cf. P. HACHET-SOUPLET, *Les Animaux savants*, p. 259, Lemerre, Paris.

[2] Cf. CH. DARWIN, *The Power of Observation in the Lower Animals*, *Nature*, VII. p. 360 (March 13, 1873), reprinted as an appendix to *The Origin of Species*. Dutch translation by Dr. Hartogh Heys van Zouteveen, Gebr. Cohen, Arnhem, 4th edition.

two terms, which would lead us too far astray. Perhaps the sequel may prove that this is needless. Therefore let us for the present be content with the knowledge that we are speaking of mental as well as of muscular habits; that James himself does not reserve the word habit for muscular reactions only,[1] and that we have already laid stress on the fact that the psychical memory invades the motor system more readily when our Consciousness diminishes. After these preliminary remarks we may introduce this author's citation: "Riderless horses, on many a battle-field, have been seen to come together and go through their customary evolutions at the sound of the bugle-call. Most trained animals—dogs and oxen, cart-horses, 'bus-horses, carriage-horses, etc.—seem to be machines almost pure and simple, undoubtingly and unhesitatingly doing from minute to minute the duties which they have been taught to do. In a railroad accident to a travelling menagerie, which occurred in the United States in 1884, a tiger, whose cage had broken open, is said to have emerged, but presently crept back again, as if too much bewildered by his new responsibilities, so that he was without difficulty secured."[2] The explanation of this surprising behaviour is probably much simpler: the tiger was under the influence of his reduplicative memory when he crept back into his familiar cage. As we shall see when we come to treat of automatism, the mental life of animal—and of Man also to a great extent—is much more regulated by past experience than is commonly believed.

It is generally admitted that all the higher animals are capable of remembering certain things, but it has not been sufficiently emphasised that it is chiefly the

[1] C.f. "*The habits* to which there is an innate tendency are called *instincts*" (*l.c.* p. 104), and for ROMANES "instinct is hereditary memory."

Some authors use the words "habit" and "memory" as synonyms: "Habit or memory is nothing more than the ability to accomplish in a reflex manner acts that were originally voluntary." VIGOUROUX et JUQUELIER, *La Contagion mentale*, p. 25, Doin, Paris. 1905.

[2] Cf. W. JAMES, *Principles of Psychology*, pp. 121–22, vol. i. Macmillan & Co., London. 1890.

reduplicative memory that is brought into play. Yet it is still exclusively on this mental process that all training is based. The only difference between man and the brute in this respect consists in this—that a trained soldier, for example, bridges over any pair of acquired automatisms with his reason, while most animals are capable only of learning all that they can be taught in this manner in a single and unalterable sequence.

The significance of reduplicative memory in animals becomes apparent in such behaviour as the following: "Whosoever has hunted rabbits with the ferret will have had the opportunity of observing that, if the warren has already been visited by a ferret, the rabbits show little disposition to come out; they rather prefer to be seriously injured by the ferret than to come out and meet the dangers that are waiting for them outside. This shows that the rabbits associate, thanks to their past experience, the presence of the ferret in their holes with that of the hunter at the entrance of these holes (for any care that the sportsman may display as to silence, etc. is wasted), and the image of this danger is so vivid that the animal will bear for a long time the pain caused by the teeth and claws of the ferret, as well as the resulting terror, before he thinks of exposing himself to the more distant but more fatal pangs which he fears from Man."[1] We may observe a similar behaviour much lower down in the scale: "We shall discover that a *Solen ensis* or razor clam quickly comes out of its hole and leaves its dwelling-place whenever we drop a little salt into the aperture. But if we take the mollusc in our hand at the moment when it appears at the surface and repeat the experiment several times, we shall very soon use our provision of salt in vain: the solen remains at the bottom of its hole."[2]

We are allowed to infer from these observations that the perception of the first sensation provokes the revival

[1] Cf. G. J. Romanes, *L'Evolution mentale chez les animaux*, pp. 140–41, Reinwald, Paris. (French translation.)

[2] Cf. P. Hachet-Souplet, *Examen psychologique des Animaux*, p. 25, Schleicher, Paris. 1900.

of its whole past experience and allows the animal to choose: it adopts a passive attitude.

It is suggestive to compare this manner of animal reaction, from which we infer the existence of reduplicative memory in primitive organisms, with the behaviour of very young children. "Baldwin observed that a child of fourteen weeks stopped crying from hunger at the sight of a lighted match, although this was only the habitual signal for the preparation of his food; we have here a phenomenon of anticipation which we have already encountered and is characteristic of what is called "associative memory"; the case is quite analogous to that of Tiedmann, cited by Perez, in which a child of five months stopped crying as soon as its nurse put on her mantle, the precursory token of a walk. Very similar, too, is the observation of another child in its fourteenth week with whom the smell of flowers provoked movements of suction, simply because its nurse commonly wore in her blouse a bunch of flowers of which it inhaled the scent whilst sucking."[1]

The infant at such an early age is certainly no more conscious than the animals considered before, so that we may infer that the practical use of reduplicative memory for the purpose of anticipation is independent of any consideration of consciousness. Man has retained this unconscious process up to the present day, but he also disposes of it in a conscious manner. For, as a matter of fact, we make an incessant unconscious use of reduplicative memory in the act of anticipation, when we think, when we prepare ourselves for a certain action; we seldom strike upon the right course to adopt from the very first; we consider different ways of meeting our difficulty one after the other. For example: let us say that to-morrow we shall have to make a call which we should prefer to postpone. We search in our memory for some excuse we could plausibly offer. One after another occurs to the mind, but we do not reject the first,

[1] Cf. H. Pieron, *L'Evolution de la Mémoire*, p. 307, Flammarion, Paris. 1910.

to pass on to the consideration of the next, before having made an estimate of the consequences which would probably ensue. Without our being aware of it we follow the cause in its probable effects; thereby we unwittingly take advantage of our experience, and in a flash we utilise our reduplicative memory. Among the recollections that appear before the mind's eye we attach some importance only to the initial and terminal presentations of our memorial concatenation, with the result that the effect seems to follow immediately upon the cause.

We must not, however, lose sight of the fact that we do not become conscious of the majority of these inner deliberations; such mental operations proceed without subjective attention, in a spontaneous manner, and it is only the end-result which rises to consciousness, after it has been adopted as the proper line to follow. This fore-conscious deliberative process has been submitted to a lengthy examination in my book on day-dreams. (It is obvious that this process may also take place consciously.)

We call the reader's attention to the fact that whereas in the previous pages we have considered only the characteristic unrolling of the past which is proper to reduplicative memory, we bring the latter for the first time into touch with causal relations. We are, however, entirely justified in doing so; and this one instance will suffice to prove. When my son was a few years old he cried one day because he was not allowed to assist the maid who was ironing linen. After a fruitless intervention I decided that he had better learn from experience that my warnings had a meaning. I allowed him, under discreet supervision, to handle a warm iron, but I warned him at the same time that if he burned himself and started to cry I should punish him. What was bound to happen happened: John burned himself slightly, but bravely suppressed his tears. Since then he has never asked again to repeat the process, and when the new maid slyly suggested that he should help her with her ironing he refused, telling her of his former experience. In doing so he reproduced the event *in toto*, but his refusal was obviously based upon the faculty

of recalling past experience in an abridged form. We may admit that at every refusal the child recalled the past in this abbreviated form, and passed from the evoked cause to the final result without stopping at the intermediate details.

We know now that the mind utilises reduplicative memory in at least two ways : it takes advantage of its abridged form, or the past is revived stage by stage, and always in the chronological order, when we wish to trace an element which refuses to return at once when recourse is had to synthetical memory.

Reduplicative memory may therefore be regarded as being at the origin of the knowledge of causal relations. For the needs of the present study it will suffice to point out that such is also the case with temporal and spatial relations ; but this is a question which lies beyond the scope of this essay. Suffice it to say that, according to circumstances, the mind may utilise the replica of the past which is at its disposal in order to establish a chronological sequence in the events under consideration, or else to make a comparison between things near and things remote. I shall devote a few more words to this problem later on.

However, the rôle of reduplicative memory is already clear to us : it is the pristine condition under which any organism can escape from danger through the simplest inhibition one can imagine : the inhibition of contractility. Neither can we represent to ourselves the possibility that the primitive organism might take advantage of a lucky chance action without its existence, or—and this takes us higher up the zoological scale—that it might profit individually and permanently by happy fortuitous circumstances or reactions.[1]

But it does not merely allow the individual to fix lucky

[1] In passing I will call attention to the fact that the theory of natural selection need not be invoked here. Thanks to reduplicative memory, which does not even always require a repetition, a successful reaction may be retained by the individual without the intervention of outside factors, and it will further be shown how reduplicative memory enriches and develops the mind that is equipped with it.

chance reactions. At whatever stage beneath the conscious level it is considered it allows a certain degree of anticipation which does not depend upon the outer world, but which is, on the contrary, conditioned by the inner state of the individual under consideration. This is a question which we shall presently discuss.

But if the simplest form of anticipation—inhibition of a contraction—should be possible, it is required that the individual shall have survived the danger that has threatened it, otherwise its registration of the successive stages of the event will not be of any use to it. Does this lead to an explanation of the persistant error of instinct in animals like lemmings, of whom Darwin reports that they perish miserably at every migration by marching into the sea. Inhibition and choice must have become impossible for them since none escape. However, before entering upon the discussion already mentioned I want to emphasise the fact that the existence of reduplicative memory is independent of the state of consciousness, thus contradicting Dugas, for whom " memory cannot be conceived without consciousness."[1] Still, it must not be thought that the registration of experience is performed by the animal in a passive state, similar to that which is characteristic of man in his distracted moments. What we understand by this passive attitude has been suggestively described by Dostoiewsky in the following passage of *Crime and Punishment*: " I was coming to you," began Raskolnickof, " but how is it that on leaving the Haymarket I came along the Nevsky Prospekt? I never pass this way; I always turn to the right when I get to the bottom of the Haymarket; and isn't it the way to get to your place? Scarcely have I turned this way but I see you! How strange!" " But apparently you have been sleeping all these days," replied Svidrigailoff; " I myself gave you the address of this café, and it is not surprising that you should have come straight to it. I told you the way to come and the hours at which I could be found. Do you remember?"

[1] Cf. L. Dugas, *La Mémoire et l'Oubli*, p. 8, Flammarion, Paris. 1919.

"I have forgotten it," said Raskolnickof with surprise. "I believe you; I gave you these directions twice over; the address has engraved itself mechanically upon your memory, and has guided you unconsciously. Moreover, while I was speaking to you I noticed that you were absent-minded."

The attitude of animals who remember certain events is quite different. Think of the dog who follows attentively every morsel that one puts into one's mouth when one is taking a meal. His attention is so strong simply because of the strong affect aroused by the scent and sight of the victuals, and similarly it is probable that the recollecting process is not voluntary but dependent chiefly upon external circumstances, which also aroused his affects. But this attention results, for him, in a knowledge which we have long ignored, because the means of communication between man and animal are practically null. It is this knowledge which is registered, together with the successive representations of reality, and which makes the latter of value to him: the knowledge of the causes.

If we had a spontaneous propensity to register in all cases the happenings of the outer world in the order of their occurrence and no more, one might be inclined to suppose *a priori* that in the conscious state we should always become aware of the causes before we experienced the affects. In reality if we were thus mentally equipped we never should become aware of the causes, for we should not have reached the conscious stage: instinct "knows" the causes before the effects, and it is at the same time the highest exponent of unconsciousness.

Everybody recognises that one has to experience an affect before one can trace it back to its cause, but I shall show that this operation stands in close relation to reduplicative memory. The first and principal step to this discovery is due to the able and renowned animal psychologist P. Hachet-Souplet, Director of the Institute of Zoological Psychology in Paris. He was the first to establish what he calls *the law of recurrence*, according to which "*with the majority of living beings the associations*

take place in an order which is the reverse of the succession of the outer excitations." [1] Let us see what he understands by this :—

"The phenomenon of recurrence has been revealed to us through experimenting upon animals that we wanted to train. The professional animal trainers have long since taken advantage of this without grasping its significance. If they want to ensure that an animal will come to them when they say 'Here!' they start by pronouncing the word, which, for the present, has not the slightest effect on the beast. But immediately thereupon they offer their pupil some agreeable food; it is this bait which determines the act of approaching, which is a natural reaction. But later on the bait may be suppressed, and the word 'here,' which has always preceded the offer of the bait, provokes in its turn the reaction.

"Supposing the trainer provokes representative sensations after as well as before the affective dynamogenic sensation; still only the excitations produced before the latter will be retained. Later on one may observe that *the chain of sensations is successively attached to older and older psychological antecedents* (my italics). Thus it may happen that in a 'turn' of trained animals one animal, A., who has to 'work' after another animal, B., has finished, ends by not waiting any longer for his master's word of command, but comes down from his stool as soon as B. has finished; still later, A. will no longer wait for the end of B.'s performance to go to his master, who will be obliged to re-establish order. (The man who best hides his actual influence over the animal which he exhibits is he who spontaneously has followed the law of recurrence by attaching the reactions of the trained animal to vocal signals, or even to gestures which, to the eyes of the public, do not seem to contain anything in the nature of an order. Thus, one may train a dog to walk on his forelegs when his master turns his back upon him, when he touches some part of the scenery,

[1] Cf. P. HACHET-SOUPLET, *La Genèse des Instincts*, pp. 139–40 *et passim*, *l.c.*

when the orchestra plays a certain tune, when an assistant crosses the stage, etc.)"

When we represent the sensations by the letters *d*, *c*, *b*, *a*, and the reaction by *r*, the phenomenon appears under the following aspect :—

The arrows show

1. The order of the excitations ——————→ *d*, *c*, *b*, *a*, = *r*

2. The order of the associations ←——————

3. The order of mnemonic repetition ——————→

when *a* is an affective sensation and *b*, *c*, *d*, are representative sensations. Indeed, in animals the origin of every complex seems to be an affective sensation [1] ; this we might call the associative nucleus ; it is naturally dynamogenic. For with the exception of certain games, in the course of which they touch everything in the room, and of certain intellectual manifestations, animals show an interest only in objects which relate to the satisfaction of their needs, that is to say, their affective life.

" In recurrence, the conduct of the animal is modelled, in the course of successive experiences, upon the outside world, where the phenomena are supposed to be the same at every repetition ; it is the frequency of the same excitations that determines the new recurrent associations ; and this frequency is affected by the outside world, which is consequently also, in this case, the starting-point of psychic evolution."

The observation of animals living with man on a familiar footing furnishes numerous examples of recurrence, One of my dogs shows every sign of joy whenever I pronounce the Flemish word " *Mee!* " with an interrogative intonation, even if I do so in the night, for it is the usual signal with which I call him when he is allowed to accompany me on a walk.

[1] By this I mean an effect that has been experienced.

But Hachet-Souplet, although he explicitly writes that this phenomenon of recurrence is a real psychical regression (*retournement psychique*) does not seem to have been aware of the practical importance of his discovery. Indeed, the affective sensation which "forms the nucleus of the association" corresponds, outside the training experiment, with the effects which the animal experiences in a state of nature, and in looking forward we may say that in reality it follows the path that leads toward *the discovery of the cause that resulted in his being affectively impressed.* The cause always precedes the result.

The analysis of the spontaneous behaviour of man when he is placed under the same conditions as the animal—that is, when he is subjected to the action of forces which he has not yet subdued or discerned—shows that my supposition is correct. When I first arrived at the front, during the war, I was able after a very short time to make out whether a projectile whistling through the air was of a small or a large calibre, but I could not make the least guess as to its direction. A few months later I happened to be residing in a village which was regularly shelled from a distance of about fifteen miles. Not only was I able by then to tell the direction of a projectile, but I was one day surprised to discover, in the twilight, the very spot from which the big German gun was shelling us. I could plainly distinguish the flare of the gun at the moment of firing; I could note, by my watch, the duration of the trajectory, and take shelter if I wanted to do so. Yet hundreds of guns were being fired at the same time in the space that separated me from the Germans. It was only after I had made this discovery that I began to wonder at the special knowledge which had come to me without any conscious effort.

In reality we all apply the law of recurrence unwittingly: when my wife is expecting me in the night on my way home from a meeting she recognises my step from afar. Some people foretell the weather by the aspect of the clouds, or the direction of the wind, etc. Here is another instance of this unconscious tendency: The other day

I was standing by a bridge which had been swung to let an inland vessel pass. All at once I became aware of the noise produced by the exhaust of a petrol motor and mechanically my eye sought the exhaust pipe at the stern of the vessel, for I had unconsciously drawn the inference that it was a motor-boat that was passing. However, I did not discover what I was looking for, and I found eventually that the motor making the noise belonged to a brewery on the opposite bank of the canal; the vessel had no propeller. Obviously my mind had quite unconsciously gone back from the effect to the cause.

However, it is quite clear that in our search for causes we may sometimes be mistaken—the animal, of course, even more than we—and attribute the power of origination to an antecedent which is not causative. This is what we do, e.g., when we say that migratory animals leave us because it is too cold in our country during winter. As Hachet-Souplet has clearly demonstrated by experiment, they leave us because there is no proper food for them, but they anticipate the absence of food and migrate as soon as the antecedents of the scarcity become manifest. In the old explanation we find an error which is frequently committed by primitive people and children, and in general by all people who do not understand an observed experience. Folklore teaches us that a curative value is often attributed to a magic formula which precedes or accompanies the application of a remedy foreign to the pharmacopœia, a remedy which may nevertheless be efficacious.

After this review of the importance of the reduplicative memory at all stages of mental evolution, we may sum up the discussion by saying that thanks to this endowment, throughout the zoological series and very low down in it, the mind seems capable of detecting sometimes the cause of the actings which are experienced by the body, and which, thanks to reduplicative memory, is capable of reacting upon it anticipatively in two ways: the individual may react as soon as the first antecedent is

perceived, or it may undergo a mental repetition of the whole of the recorded occurrence, and react before any percept of the dreaded or welcome final event.

The example of the hunter or the Red Indian who regressively follows the track of his game points to the fact that the registration of a sequence of happenings may relate to space instead of origin. The observations already made in respect of weather prophets and the migratory instinct hint to the relations of time and sequence. But how far time and space may be remembered and interpreted by the animal mind is beyond our purpose; yet it may be deemed worthy of note that the tendency of the animal to review its experience in a regressive way, starting from the effect to detect the cause, is exactly the opposite of the tendency proper to reduplicative memory, which is to unroll itself in the temporal order. It reveals even more than this: it shows that the animal is not always the victim of its reduplicative memory; that its attitude towards it is not necessarily a passive one. We may infer from the possibility of its being on the watch for antecedents yet further and further removed that it has the power to inhibit its memory, just as man has. For if it were not able to regulate to a certain extent the automatic reproduction of the past, there would be no room for the function which Hachet-Souplet was the first to detect. The animal would be exclusively the slave of its past; every possibility of progress would be excluded. Indeed, we have seen already that when reduplicative memory is revived the mind becomes *ipso facto* incapable of any other activity. We may even go further and say that the animal also possesses the faculty of reviewing its memory-films in an abbreviated fashion just as we have, for if the last image of the film were not anticipatively known as soon as the first is awakened, the possibility of bringing the antecedent into relation with the consequent would be excluded.

These functions which have long been thought characteristic of the human mind only can thus be traced back in the animal mind also, long before the problem of conscious-

ness arises. Practically there are no mental mechanisms in man which have not their representatives in the beast, and we shall presently see some further instances of this truth. In the meantime we may conclude that the phenomenon of recurrence shows that the mind has a natural tendency to regress, to proceed from the known to the unknown, to build up its knowledge in the manner described in such fables as *The House that Jack built*; while it gives yet further proof of the spontaneous attention which man has developed into a conscious acquisition. From the foregoing we may also conclude that it seems probable that primitive thinking is nothing more than an immediate anticipatory adaptation, by which words we have also described fore-conscious day-dreaming.

The last part of this chapter will be devoted to the examination of the question whether reduplicative memory is not the most primitive form of the mental power of retention.

One is inclined to adopt this view because the study of abnormality shows that whenever man's intellectual powers are impaired reduplicative memory is the last mental function to disappear, and it is generally admitted that the higher faculties, constituting the latest acquisitions in the philogeny, are the first to fall into disorder in case of disease: the fundamental reactions common to all organisms seem to be the most firmly established.

In the beginning of this chapter we have already considered Freud's verdict that "hysteric patients seem to be suffering from reminiscences."[1] But whereas the dissociated state which they live in prevents them from leading a normal conscious life, to adapt themselves to circumstances, and regulate their behaviour in accordance with the outer world, experience teaches us that, in spite of an incapacity to synthetise, their reduplicative memory is still operating: all the reactions, physical and mental, to which they are accustomed, may still be performed in

[1] Cf. S. Freud, *Ueber Psychoanalyse*, p. 10, Deuticke, Vienna, 1919, 4th edition.

the old way, but they may be unable to recognise familiar objects, as a tree or a bench, as soon as they leave their usual surroundings. (They cannot perceive anew, that is, make a new synthesis.) Others no longer understand what is said to them in their mother tongue; others are able to read but do not grasp the meaning of the text although they can reproduce the words, etc.[1]

A patient who presented just such an incapacity for integrating new knowledge proved, on the other hand, that the past was living uneffaced in her mind: Léonie, being in the cataleptic state, "I put her hands in the attitude of prayer: her face assumes ecstatic expression. I do not interfere, for I want to see how long this expression will last. I see her rise from her seat and slowly make two steps forward. Then she flexes her knees, but all the time with a peculiar deliberation:—she kneels down, bends her body forward, her head bowed and her eyes turned toward the sky in a wonderful ecstatic pose. Will she remain thus, and, the posture being complete, retain a cataleptic immobility? No, here she stands up without my having touched her; she bows her head again and joins her hands before her mouth; she advances four or five steps more slowly even than before. What can she be doing? Now she performs a deeply reverential curtsey, kneels once more, lifts her head a little, and with half-closed eyes slightly opens her lips. Presently I understand: she is going to communion. And, in fact, when communion is over she gets up, bows again, and with her head inclined sideways, she again sinks to her former position."[2]

This observation shows clearly that reduplicative memory is intact, whereas conscious synthesis has become entirely impossible.

The lower down the zoological scale, the less an animal seems to be able to recognise or to show any interest in the objects of the outer world. Moreover, the number of its reactions are strictly limited and are practically

[1] Cf. P. JANET, *Névroses et idées fixes*, pp. 46–47 *et passim*, *l.c.*
[2] Cf. P. JANET, *L'Automatisme psychologique*, p. 20, *l.c.*

always the same. We infer from this that, like the patient mentioned above, its power of synthesis is weak and that reduplicative memory is the chief factor of its mind. Reduplicative memory should thus appear a primitive function in the individual and the race.

But let us continue our review of abnormality, taken at random from the innumerable cases recorded in psychological literature. Ribot writes: "Certain idiots, who cannot make the most elementary calculations, repeat without hesitation the complete multiplication table. Others cite by heart pages which they have been taught, but do not succeed in learning to distinguish the letters of the alphabet. Drobisch (*Empirische Psychologie*) reports the following fact, which he has witnessed personally: A boy of fourteen, nearly an idiot, had had great trouble in learning to read. Nevertheless, he had a marvellous faculty of retaining the order in which the letters and words succeeded each other. If one gave him two or three minutes to run through a page printed in a language which he did not know, or treating of questions which he ignored, he was able to spell from memory the words that stood there, absolutely as though the book lay open before him."[1]

It would be very easy to multiply these citations, for similar observations have often been made. The above will suffice to emphasise the fact that reduplicative memory is a stage beyond which the dullest, simplest, most abnormal minds cannot go, nor a normal man fall back. For these poor creatures' memory does not extend beyond the reproduction and registration of sensitive images without meaning, and therein they resemble most animals. The latter, too, retain a great number of sensations which cannot have any meaning for them: lightning and thunder, for instance, may represent for them nothing but what they see and hear, or sometimes what they suffer from the former; and the mythical explanations that are still current among the children, the uneducated and all the primitives of the world exist only to hide their ignorance.

[1] Cf. Th. Ribot, *Les Maladies de la Mémoire*, p. 104, *l.c.*

This natural phenomenon has not for them the scientific meaning it has for us. As long as sensations cannot be compared with other sensations, new images with old ones already existing in the memory: in short, where synthesis is impossible, the mind does not understand; there is no intelligence, as we usually say, for reduplicative memory alone is not a proof of intelligence. Only where there is choice—conscious or unconscious—may we speak of an act of intelligence. And to compare like with like is also to make a choice.

The lower mind, that retains images in a pre-established order, is much in the position of a chemist's assistant without scientific knowledge who performs faithfully all the actions required for the preparation of a medical prescription. There is memory of the signs and figures; an external memory, but no inner understanding However, the signs or images themselves, when they are assembled in accordance with certain laws which only the philosopher tries to make out, become the material wherewith intelligence is built up. This is a point which will be developed in the next chapter, where we hope to demonstrate also that the outer associations (such as acoustic associations) which are characteristic of unconscious human thinking, are replicas of the ideation proper to animality.

But if reduplicative and synthetic memory be antithetical at the two poles of mental development, we shall be confirmed in our supposition if the ontogenic repetition points to a similar evolution. This seems, indeed, to be the case. "The older and the more instructed a human individual becomes, the more he learns through comprehension; the adult retains only what he understands; the better he understands, the better he retains. The child, on the contrary, or the undeveloped individual, learns mechanically, like a parrot, without understanding; he remembers associations and consonances; he makes use of mnemonic means.[1] "When one thinks," writes

[1] Cf. Dr. Grasset, *Le Psychisme inférieur*, p. 232, M. Rivière, Paris, 2e édition. 1913.

Van Biervliet, " of the immense quantity of images which the child stores up in his cerebral centres, as though in a game, and of the effort required of an adult in order to fix a memory, one naturally arrives, so it seems, at this conclusion: namely, that the power of fixation, from childhood to old age, decreases in one way and increases in another: plasticity diminishes, but the power of attention is increased." [1]

The ability of young children to memorise series of associations without any understanding of them, that is, without any synthesis, is curiously reminiscent of the relative facility of the memory of trained animals, and there is little doubt that we are here in presence of the same phenomenon at two different stages of mental development. Ribot also remarks that " it has often been noticed that, among the inferior races of mankind, the children who are sent to school, or to whom one tries to give instruction, display at first an astonishing facility, which is suddenly arrested. Thus the aborigines of the Sandwich Isles display an excellent memory; they learn by heart with marvellous rapidity; but they cannot exercise their thinking faculties. (I once more remind the reader that I have defined thinking as the decomposition of memory to adapt the proper elements to a present situation under the influence of affect or will.) " In his infancy," says Samuel Baker, " the young negro is more advanced than the white child of the corresponding age, but his mind does not bear the fruits which it promised." [2] Dugas observes that " missionaries have reported of certain savages that they are able to repeat, without any alteration, a sermon which they had just heard, a feat of which Chateaubriand is also said to have been capable."

These instances and many others which may be found in the works which I cite, give us the right to suppose that duplicative memory is indeed characteristic of mind

[1] Cf. J. J. Van Biervliet, *La Mémoire*, p. 198, Doin, Paris. 1902.
[2] Cf. Th. Ribot, *L'Hérédité psychologique*, p. 311, Germer Ballière, Paris, 2e édition. 1882.

in its earlier stage of development. The complete proof, however, will only be given when we have established the converse thesis: namely, that synthetical memory is an indication of mental powers of a higher order. In the meantime we offer the final remark that folklore grants the child nothing but reduplicative memory. It is from this starting-point that popular tales, as that of *Stupid Hans* (in Grimm's *Kindermärchen*) should be appreciated. The joy of the young hearers finds its origin in the erroneous but literal application which Hans makes of his mother's hints,[1] and perhaps the lasting success of similar stories may be attributed to the fact that the children unwittingly find a mentality like their own in the personages which they introduce.

[1] This is the translation of a Flemish folktale which shows still better than the well-known story of *Stupid Hans* the reliance of the parents on their children's reduplicative memory, thus betraying the popular conception of the child's mind: *The son of tall Wannes* (Wannes = Johannes). In a small isolated farm not far from town lived a poor farmer, called "tall Wannes." From dawn till late at night he worked on his field. His wife took care of the household, and every Friday she went to the market with butter, eggs or chickens. Once the poor woman was so ill that she could not go. She called her ten years' old son and said: "Go to the market in my place. Here is a bag containing two hens. Walk always straight on along the main road and where you see a number of people gathered together, there is the market. You will be asked: 'Who are you?' You will reply: 'I am the son of tall Wannes.' Then you will be asked: 'What do you come to market with?' and you'll answer: 'With a couple of chickens.' Then they'll tell you: 'I shall give you so or so many shillings for them.' But you must say: 'No, that is not enough, I want twice as much as that.'"

After the boy had repeated his answers so as to know them well by heart he started with his bag. On the way he kept on repeating to himself: "The son of tall Wannes—With a couple of chickens—No, that is not enough, I want twice as much."

Close to the market-place two policemen stopped him, asking: "Well, sonny, what's in your bag there?" "The son of tall Wannes," replied the boy without hesitation. "Now, then, who are you getting at?" "A couple of chickens," came the quick answer. "You cheeky brat! You'll get three strokes of the cane, young man!" "No, that is not enough, I want twice as much. . . ."

The story also subtly indicates the unconsciousness displayed during the act of recollecting. We might almost attribute the boy's lack of attention in respect of the policemen's questions to a sort of "narrowing of the psychic field."

Besides the arguments drawn from abnormality and mental evolution it may finally be repeated that reduplicative memory appears as a fixation without synthesis. It is an integral registration and reproduction, which does not mean that there is assimilation. (Synthetical memory, as we shall soon see, consists in a partial and selected integration susceptible of being revived partially and *ad lib.*) The former allows us to infer a tendency to accumulate experience indiscriminatingly. However, it may be used as a basis for the knowledge of causal, temporal and spatial relations throughout the animal scale. This result is obtained by a regression, the mind reascending from the terminal image of the series to the initial one.

It may also be of some importance to note that in the different records of reduplicative memory the ego does not occupy a central place, but they all terminate in the self; in synthetical memory, on the contrary, all the recollected elements are egocentric and are often transformed and disguised by our affects.

Our day and night dreams, and mental diseases, teach us that no experience whatever is lost for the individual as long as he lives, but it is remarkable that it is precisely during the lapses of our consciousness that we experience this fact. We cannot resist the temptation of bringing it into relation with this other fact—that it is under the same circumstances that reduplicative memory seems fully to recover its primitive rôle of unfolding itself spontaneously. It would appear, then, firstly, that it is chiefly thanks to our reduplicative memory that we recall the past as the past, even when we deemed it long forgotten; and secondly, that consciousness has, amongst other functions, the power of inhibiting, of keeping in oblivion the contents of the reduplicative form of memory in favour of its synthetical aspect, the elements of which bear no date or mark of localisation. It also seems that for the needs of our voluntary thinking we have recourse much oftener to synthetical memory, with the exception

of the causal, temporal and spatial relations of things. This is a point which will be further developed in the next few pages, where the question will be considered whether we do not recur to reduplicative memory, not only when synthetical memory leaves us in the lurch (that is to say, that we take the longest way to get at a recollection which we want, when the shortest does not lead us to it), but also every time we wish to test the exactness of the remembrance which we have so traced along the shortest road.

In my opinion reduplicative memory is the primitive condition under which a simpler organism can preserve its life, for it allows it at least to react anticipatively should the *same* conditions be reproduced in the outer world. Highly organised beings, on the contrary, know how to maintain themselves under practically all the conditions of their surroundings, while as we descend the zoological scale there are gradually more and more in the presence of which the individual is powerless. Such is my conception of the phenomenon which we have studied in this chapter.

In conclusion I wish to call attention to the similarity between this conception and what Bergson calls *mémoire pure*, which he has not, however, analysed very deeply. The former is, on the contrary, in diametrical opposition to L. Dugas' opinion, for whom " in reality such a memory is rare, exceptional, and if I may say so, abnormal. It is, so to say, only to be met in an authentic fashion in cases of cerebral fever, as in that of the butcher's assistant who declaimed passages of *Phèdre* and the vicar's maid who recited whole pages of the Roman breviary. These sudden uprisings of a past which seemed doomed to remain unknown for ever, and which appear as if by enchantment, as by a stroke of a magician's wand, to disappear in the same fashion like a suddenly vanished eruption, cannot really represent typical memory any more than a volcanic convulsion, which to-day provokes the appearance of an island in the middle of the ocean and to-morrow sinks it into the abyss, could represent the

formation of the strata of the earth. *La mémoire brute* (raw memory), as we shall call it, the simple repercussion of past perceptions, is not the true, the proper memory, it is only the raw material or the elements." [1]

[1] Cf. L. Dugas, *La Mémoire et l'Oubli*, pp. 13–14. *op. cit.*

CHAPTER II

SYNTHETICAL MEMORY AND PERCEPTION

Synthetical memory is utilised in Perception—Analysis of Perception—Our affects colour our perceptions, consequently our synthetical recollections also—Synthetical memory retains grouped elements and the relations between them—Uses of these relations in the acts of recalling and of perceiving—The two forms of memory in mutual assistance—The wish is their stimulus—The repression of disagreeable recollections—The genesis of Memory.

WHEREAS in the previous chapter we had to break our own road through an almost entirely unexplored field, we shall now cut in upon a familiar one, for it is chiefly the synthetical memory which has up to now been the object of psychological research. We shall not have to prove its existence ; thus we shall be able to concentrate all our efforts on its genesis, its development and its relations with the primitive form which we have just examined.

However, before entering upon this discussion it would be prudent to settle the limits of our domain clearly, so as to avoid any error of interpretation, proceeding from the absence of precision in terminology. This is why I wish to state from the beginning that I share the view-point of Bergson, for whom, besides " an integral or true memory . . . which retains and lines up, one after the other, all our states, as they present themselves, leaving each fact in its place and consequently in its chronological position, there exists a partial and biassed memory, (*une mémoire partielle et partiale*) which is selective and utilitarian, which only retains of the past what the mind profits by retaining and assembles facts in an

order of logical dependance, not in the succession of time." [1]

Synthetical memory being known as the function which registers a selected classification of experience, a first question suggests itself: in what manner does this classification proceed? From the moment this operation is not made deliberately, intentionally and in full consciousness—which constitutes the exception—it can only be the unconscious that presides over it. And this involuntary spontaneous classification is registered, hidden in the unconscious self, whence it is recalled and utilised, when circumstances require it, with the same absence of effort, even when the mind is at the opposite pole of alertness.

Our first task will be to review some observations which will permit us to overtake the mind in the very act of synthetisation, without awareness of the mental operation which is being performed. This is precisely what happens while perception is being accomplished (and is in some cases known as inspiration). To use Bergson's words: "It is supposed that the present perception always dives down to the bottom of memory to obtain the recollection of the anterior perception which resembles it: the feeling of *déjà vu* would arise out of a juxtaposition, a fusion of the perception and the recollection."

It is this fusion itself which we want to observe, while it is taking place.

Most of the modern psychologists admit that memory intervenes in perception. Wundt, amongst others, concludes in this sense, because experiment proves that we remember more easily a series of words having a meaning, than an assemblage of letters which have none. Ribot, also, is equally correct when he writes: "It is generally admitted that a synthesis of images is needed to get beyond the stage of feeling and arrive at a perception. More simply, two elements are necessary: one which comes from the outside, the physiological event acting on the

[1] Cf. H. Bergson, *Matière et mémoire*, p. 78, *et passim*, Alcan, Paris, 13e édition.

nerves and the sensorial centres, which is translated in consciousness by the undefinable state called sensation; the *other coming from the inside* [my italics] which adds to the present sensation the appropriate images, the leavings of anterior experience. So that perception necessitates a training: first we must feel, then perceive, awkwardly, before at last we perceive well. The sensorial part is only a fraction of the total fact, and in the operation which we call perceiving, that is, apprehending an object directly, a part of this object only is represented." [1]

This manner of understanding the phenomenon of perception coincides exactly with mine (I intentionally avoid discussion of the more ancient views which authors have generally abandoned in recent times). But I have been surprised to note that, although the active contribution of memory in the act of perception is no longer discussed to-day, not one of my predecessors seems to have communicated observations such as would make the revivification of recollections, consecutive to sensation, visible to all or to have brought the mechanism of recall to view, so as to leave no one in doubt. Such at least is the impression left by my reading. This gap I wish to fill before proceeding.

(*a*) The other day, walking along an avenue as it began to get dark, I saw, coming towards me, something looking like a number of large irregular black and white patches. I craned my neck spontaneously and made a semblance of stopping: Was it a cow advancing upon me at a couple of yards' distance? But soon I was unable to repress a smile: it was a sort of perambulator pushed by a young mother wearing a white blouse.

(*b*) Another time, I was waiting in full daylight on the platform of St. Peters station in Ghent for the arrival of the Ostend train. As frequently happens when I have some moments to spare, my mind was a hundred leagues from what was happening around me, when my glance was attracted by a rather bright electric spark

[1] Cf. Th. Ribot, *Essai sur l'Imagination créatrice*, p. 88, Alcan, Paris. 1900.

produced on another platform at a good hundred yards' distance; only the spot, where the spark showed, seemed hidden by a small wooden structure in the middle of the platform. Without giving any particular attention to this (for it was subsequent analysis which permitted me to retrace all these details) my mind immediately supposed that the spark must be produced from an electric arc-lamp, and then from the contact of the rod of an electric tramway, for my glance searched the air for a cable which did not exist, and a smile came to my lips as my eye sought a tramway in the station building, instead of outside. Then returned the visual recollection of part of Victoria station in London, where the electric trains with overhead cable and the trains moved by steam run on the same rails. Finally I ended by discovering, as the spark was again produced, that it was due to the luggage-lift, which is protected by a wooden superstructure as above mentioned.

These two observations, of which any one can verify the mechanism in his own person, suffice to show that every sensation spontaneously awakens in the memory images similar to that which excite the sensory organs, and that these mnemonic elements serve for its interpretation and identification. But it also follows that these recollections receive no proper signification from the mind, which tries to perceive without the assistance of volition; the representations are handled, so to say without consciousness, without being recognised, without proper personality, like playing-cards seen from the back; and it is only when the image adequate to the sensation is revived that consciousness intervenes, and wakes up to register the perception with a feeling of *fiat*.

Henceforth it will be part of memory in the sense attributed to it; that is, it will be classified in the same category of images which sensation has spontaneously evoked.

Here is thus a first fact established: in the act of perception the mind evokes images to which it does not attribute any distinct meaning and of which it identifies

only the last, the one which gives it proper character to the sensation and makes it a perception.

We will now examine in what sense the recall of the mnesic elements which sensation reanimates is enacted. Let us still refer for enlightenment to direct observation.

(*c*) During a short period of rest I am reading a paper. At a certain moment the name *Goethals* passes before my eyes and immediately my mind evokes the name of *Goedseels*, to which a recollection is attached which it is unnecessary to communicate. Between the unknown *Goethals* and my friend *Goedseels* there is not the slightest connection, as far as I can see. Only the two names considered as images without signification have this in common, that the three first letters (and the three first sounds) are the same; and it is undoubtedly to this partial similarity that the unexpected awakening of the recalled name is to be attributed.

The following observation shows the contrary phenomenon:

(*d*) I am in the street in conversation with an acquaintance. We are racking our brains to remember a name which obstinately refuses to come to our lips. I am nevertheless aware that it contains *a* and *d*. I even make an attempt at the name *Van Dooren*, but that is not it. While I am absorbed by this fruitless search I greet a gentleman who is waiting for the train and my lips automatically pronounce his name: "*Mr. Lannoye.*" At the same moment I have the intuition that I am on the verge of at last finding my way back to the name which I am looking for, and repeat mechanically: "Lannoye, Lannoye;" then with a feeling of satisfaction I shout to my companion: "It is Lanote!" Still, between Messrs. Lannoye and Lanote there is no connection, and I again estimate that the fore-conscious perception of the first name has brought forth the second, which we were looking for.

The two names have once more been dealt with by the mind as auditive or visual images, independently of the personality which they represent.

(*e*) A gentleman who does not understand Latin once understood, when the maxim *errare humanum est* was quoted in his presence; the words to be: *erreur et baromètre!*

We may now state that we perceive in the sense of past experience, of the contents of memory. Besides, we already know, and simple reflection might have told us, that the mind apprehends the unknown with the help of the known: knowledge is a construction in height; not in depth.

We now proceed to the examination of a fresh problem. Which are the factors that imprint its proper direction to perception? In other terms: whence do our perceptions derive their orientation, seeing that will is strange to them, and intervenes only at the moment when the contribution of memory to the sensation has come to an end? I cannot resist the temptation of reproducing a suggestive anecdote which is worth a long explanation, although it is extracted from a German humorous publication. " In a railway-carriage six persons, previously unknown to each other, enter into conversation. This becomes so interesting that one expresses regret that another has to get off at the next station. Thereupon the other answers that he prefers such an encounter of unacquainted people to a meeting of friends, and that, under such circumstances, he, as a rule, never asks, who are his travelling companions, nor does he divulge who or what he is. Then a third confesses that this is exactly the problem that is occupying him, and that he will tell the occupation of each of the others, if they will consent to answer any indifferent question he will put to them. Everybody being willing, he tears five sheets out of his pocket-book and writes a question on each, begging his companions to answer it. When the papers are give back to him, he reads them and says unhesitatingly to the first: " You are a scientist; " to the second, " You are a soldier; " to the third, " You are a philologist; " to the fourth, " You are a journalist; " to the fifth, " You are a farmer."

They all admit that he is right: At that moment he has reached his destination and leaves the carriage. But the five others are curious to know the question which the others had had to answer, and they find that they have all answered the same question; "What is the thing that destroys what it has itself produced?"

The naturalist had answered: "Vital force"; the soldier, "war"; the philologist, "Chronos"; the publicist, "revolution,"; and the farmer, "a boar."

Se non é vero é ben trovato. The narrator allows the journalist to continue with these words: "The humour of it consists in this: everyone answers the first thing that presents itself to his mind and this is always something in close connection with the object of his life." We are all, in fact, utilitarians, and we orient our acquisitions toward the use we might put them to later on. Within each of us one tendency surpasses the others, and it is this fact that colours the entire contents of our synthetical memory.

But I want to get absolutely to the bottom of things and not to be satisfied with this first trial of a solution to our problem. As volition does not directly intervene in the intimate process of perception, and as there is a question of tendencies which determine the sense of this psychic operation, what must be understood by these? Here as everywhere else, pathological cases will lead us along the path to discovery, for they exhibit the phenomenon for which we are looking in an exaggerated, extranormal form. It is for this reason that I still propose to examine certain observations taken from my own records:

(1) One day during the war, as my colleague De M. entered the mess-room after a ride, I said to him: "Do you know that *Thomas* came here for you?—"Great Scot! that's quick," he replied, "I did not expect *them* so soon!" As I was on the lookout for observations to enrich my collection, I immediately inquired the reason of his error, and he told me that he had understood me to say *tomatoes* instead of *Thomas*. (In French

both *Thomas* and *tomatoes* have the accent on the second syllable.) He then explained to me that during his ride he had met a farmer who had promised to bring us some tomatoes, and that the similarity between the name I had uttered and that of the vegetable he was expecting had been the cause of his misunderstanding.

(2) The same colleague hears me say at mess, "To-morrow I am going to *Winnezeele* (a small village in French Flanders where the General Headquarters of our army corps was established). He shouts out: "What, you are going to *Buenos Ayres*?" We immediately analyse the case, and he tells me that Buenos Ayres is of great interest to him, as he intends to settle down there after the war. Besides, he knows that there has recently been some question of a mission to America which might be confided to me, "so," adds he, "my mistake wasn't so silly after all." And in fact the two first syllables of the words *Winnezeele—Buenos Ayres* offer a great resemblance, owing to the close relationship of the two explosives *B* and *W*. The fact that should fix our attention is that the meaning of the error is clearly determined, as in the foregoing cases, by the affective recollection which is so easily—all too easily—released. Here, literally, *un demi-mot suffit.*

(3) One morning at the front I receive a letter from a friend, and as he has had to write his name and address on the envelope, in order to benefit by the free postage service, I read, with a careless glance: "J. Goedseels, Service des *réclamations*, Hondschoote." I soon remark with surprise that I have read the words wrongly, for the words on the envelope are: "Service des *inhumations*." Whence did the error of perception proceed? The letter came just in time, as I was about to make a complaint (*faire une réclamation*) to the Army postal service for having lost my last letter, which I thought my friend Goedseels had not received. It was the recent recollection of this "réclamation" which the sensation evoked. Besides, the visual and auditive similarity between réclam*ation* and inhum*ation*, considered as images void of mean-

ing, was important enough in any case to account for the unconscious phenomenon.

I will stop with these examples because they are sufficient to demonstrate that the recollections bearing an affective emphasis are those which are most volatile, those which bubble up most readily at the behest of sensation. In this case as well as in the first observation of the foregoing chapter, the mind revives the dormant images and deals with them without giving them any significance on the actual awakening ; in this way a faint resemblance is sufficient for evocation.

We may conclude that our sentiments, our affects, are the factors which determine the meaning of our perceptions, as it is they that decide which mnesic elements will surround the sensation aroused by our organs, which are in touch with the outer world. This hypothesis is confirmed, moreover, by pathological cases of illusion and hallucination.

There is, however, a question which might arise in the reader's mind, and which deserves a moment's attention. If we may admit that in all cases where our sentiments have free play our perceptions are influenced by them, it is difficult to imagine what rôle the affects play in the unconscious revivification of mnesic elements upon excitations proceeding from objects which leave us completely *indifferent*. To this objection I would reply as follows : We are very bad judges for appreciating all that touches the affective domain because our mind does not seem to be equipped for it : we are sometimes passionately moved by a thing without being aware of it ! Our psychic endowment predisposes us more towards the evaluation of the acts to which our affects lead us, but how often without discovering their deeper motives ! Moreover, whatever safety life may enjoy in civilised society, we ought not to forget that the more we examine the primitive conditions of existence, the more the number of perceptions indifferent to the animal decreases, until the border is reached where we hypothetically locate the first perceptions in mental history, where only a very limited number remain ; there they can easily be classified under two

headings : those which are useful and those which are harmful to the individual. For the primitive animal in search of sustenance there are no indifferent perceptions ; for which reason we maintain that originally every external excitation liable to be perceived wears a hedonic mark and signifies pleasure or pain for the living being. The indifferent perceptions have become the privilege of civilised man, and that is why we find no difficulty in admitting that in our unconscious also the affects govern perception. In other words, our sensations are interpreted with the aid of recollections which do not cross the threshold of consciousness (except sometimes the last of all), and are revived by the affect which the sensation has aroused. The perceptions never become indifferent either in man or in the animal : a dog which was beaten in its youth never sees a whip but it immediately gives all the outward signs of fear ; a severe fright in infancy or childhood may impose phobias, repulsions, unconscious antipathies upon the adult, sometimes disguised, but always insurmountable. This enables us to understand why all recollections which have come to us by synthetisation, or by way of perception, as a result of the collaboration of sensation and memory, bear a personal stamp. In fact, they have undergone a classification in function of their hedonic value, and are coloured in a special manner owing to the influence of our affects. And as this psychic operation is executed without the intervention of the will, we understand that it also must be independent of the functions proper to the conscious state ; in other words, it does not proceed differently in animals and in man (taking into account, however, the difference in the complexity of the relations which may be established between the mnesic elements). This is what I meant before when I stated that synthetical memory is egocentric. This is also the opinion of Ribot, when he insists that " sensations are perceived in connection with the ego."

I may now take another step forward and endeavour to prove that memory retains the recollection of past syntheses made in the act of perception ; that there exists

what I propose to call synthetical memory. But in reality this latter enriches our mind in two ways: not only does it retain each mnesic element synthetised with the relations which have been spontaneously established between them, so that it can make use of them in a later synthesis; but it also fixes the psychic path which has been adopted to reach the synthesis, so that the mind shall be able to utilise the same track for the synthetisation of elements entirely different from those which were revived for the first time. I will try to prove these two points consecutively. If I felt the need of it, I might be content with invoking the authority of Janet, who long ago called the attention to the fact that "memory is above all the conservation of an order, a group of images; in a word, it is merely the preservation of a synthesis made before; it is clear that memory will not exist if the synthesis has not been formed, or if it is only half formed and remains unbalanced and fragile." But in spite of the authority of this scientist, I am forced to continue this discussion because I wish to bring a few points to the fore, which will be put to use later on.

The observations which I have communicated above show that during the operation of perception the mind leaves in the background the deeper significance of the images brought near the threshold of consciousness, and only those which are judged appropriate to the sensation are allowed to cross it. Normally the images which have been tentatively or uselessly awakened leave no trace *in consciousness.*

Let us for a moment go back to observation *B* on page 56: when the flash of the electric spark meets my retina it is as though my mind were to ask: "Among the things we know of capable of producing such sparks, which is likely to be the present cause?" Then all the contents of my memory are successively gone through—arc-lamp, tramway, "overhead" electric railway, lift, etc. The enumeration alone proves that in this evocation the mind has invented nothing: all these elements had formerly been registered. But who would venture to

say that I have ever before tried to associate an electric lamp with the London Overhead Railway or with a lift? This is the novelty (if novelty there be) to which the effect produced by the sensation gives rise. No discussion is needed to admit that the mind registers the sequence which is thus spontaneously produced: I shall henceforth be able to use it when a similar call presents itself. If now the images are classified in memory in the order which I have indicated, there exists between them the relation of "things-susceptible-of-producing-sparks" apart from all other "headings." It is, to use another metaphor, as though memory retained an impression like the composite photographs obtained by Professor Galton, when he wanted to prove the resemblance or dissimilarity of the features of the various members of one and the same family, in putting their portraits on the same sensitive plate. I must add, however, that *comparaison n'est pas raison* and that this composite image no more corresponds with reality, than that of the imaginary threads joining all the mnesic representations belonging to the same mental categories. But man has only such metaphorical means of describing the mysterious operations which proceed outside his conscious observation, and with these we must be content.

Of these relations between mnesic elements, and their classification, our conscious ego is scantily informed. Moreover, our education, which is mostly effected with the aid of language, scarcely leads us to give our attention to the sensitive images which are employed in our daily perceptions far more frequently than words. It is thus rather difficult to prove that memory faithfully retains the image of the classifications spontaneously established among our recollections; above all since these relations and classifications are no longer at our disposal when the memory is no longer active, but return to the latent state. But there is at all events a certain class of memorial images as to which no doubt exists: namely, that of the words classified in our memory in order of their assonance. Such groups may be based upon similar terminations

(rhymes) or on the initial consonant (alliteration), sometimes upon an arbitrary element (for instance, as when we recall a name which contains *o* or *a* or any other letter, and successively evoke all known names which contain them) or terminations which are true assonances (containing the same vowel sounds, as *page, gate*).

In the foregoing pages we have thoroughly examined instances in which the mind makes use of this unconscious tendency to group words by virtue of assonance (namely, where there has been a question of recalled names, as *Lannoye-Lanote, Goethals-Goedseels, Thomas-tomatoes, réclamations-inhumations,* the efforts of Mercier to trace his way back to the words *cereus,* etc.), so that we may abstain from reproducing further examples.[1]

For the conscious ego words are symbols representing objects or concepts. The unconscious treats them as it treats all images: it drops their meaning and classifies them according to simularities as simple images void of sense. This explains why, when the conscious ego is no longer there to see to the restitution of its symbolic value to each word, the mind may behave in a nonsensical fashion, reacting as in a cock and bull story, and, with surprising inconstancy, pass from one idea to another which is not sensibly connected with the first, following up a faint auditive or visual similitude. (This is so in distraction, dreams, insanity, neuroses, etc.) We shall see later on that next to these purely superficial relations between recollections, there exist others which reveal more intimate and more significant connections.

Hitherto I have had no other goal than to demonstrate in a satisfactory manner that memory registers the syntheses made in the course of perception. I believe I have succeeded sufficiently to permit me to pass on to the consideration of the other aspect of the problem which I have undertaken to solve.

[1] P. JANET also remarks upon this unconscious tendency to group words according to assonance. It is manifested in his patient, Marcelle, when he makes her reproduce a text, which she had read without understanding it. (Cf. *Névroses et Idées fixes,* p. 46–47.)

I hold that when the mind has spontaneously established a certain relation between two mnesic elements, it has at the same time given up part of its liberty of action for the future, in this sense, that it is led to make use of the method of approach employed on the first occasion; in other words, next to the classified elements memory also retains the recollection of the relations which join them into units, of the connections established. This idea is far from new, but it has usually been stated in other terms. It was Spencer, I believe, who first formulated it in the following words: "The fundamental principle of mental operations is memory, for it is the *conditio sine qua non* of any mental life. But memory, seen from the physiological viewpoint, means only one thing: which is, that a nervous discharge having once taken place along a certain track, leaves behind a more or less permanent molecular alteration of such a nature that subsequently, when another discharge follows the same path, it finds, so to speak, the footprint of the steps which have preceded it. This, as we have seen, is nothing more than what we have found to be the case in ganglionic action in general."[1] This, in more modern terminology means that Spencer had already been struck by the force of the precedent in our subconscious mental reactions. I should be trying to break down an open door if I sought to prove that the relations which the mind has the habit of establishing between our mnesic elements are constantly applied to new cases, for it is a truth which everyone admits. There are more than sufficient terms to denote the phenomenon: one has a tendency to see all black or all pink; one belongs to this or that school; one sees everything from the same personal angle; one is predisposed in favour of, or against, a certain thing, and so on. What I wish to demonstrate, on the contrary, is that this influence of the past, the force of habit, which tends to establish always the same relations between our sensations and our memory, is so tyrannical that few individuals succeed in escaping from it. All those who write know

[1] Cf. H. SPENCER, *Principles of Psychology*, p. 23 Baillière, Paris, 1874.

how difficult it is to be original (and here we have in view merely the mode of perception, leaving the discussion of originality of conception to the following chapter), how difficult it is to break loose from a tendency to consider sensory data, for example, in accordance with our mental habits, or to see a side of things which others have not seen.

As a matter of fact, it is impossible when we are disposing of all our intellectual means in full consciousness. It only succeeds in states of fore-consciousness, in day-dreams, or in distraction. In other words, we only perceive in an original fashion when we are in a psychological state in which forgetfulness is possible—that is, forgetfulness of previous relations, where the affects have free play to reanimate and associate the memorial elements, when the automatism created by " the precedent " is released. And then how the new relation which the mind has established without the aid of consciousness makes us rejoice, what inner satisfaction it gives us ! We then call the power that warns us of what is happening within us intuition. In reality, that is the criterion which we carry within us to distinguish the new from the old. We are always warned by this exultation, by this joy finding, that we have created something new, that we have not followed the beaten path, that we have been original. This is what I wanted to emphasise.

The psychological automatism of Janet's patients is but an exaggeration of what happens in the normal individual.

We all have at our disposal a certain number of ways of reacting in the presence of exterior excitations. This number varies in accordance with the degree of development and education, but it is strictly limited, and originality is the exception. It is, moreover, a point to which I shall have occasion to return later on, as I shall further try to show how the automatism of some neurotic patients outstrips normality.

The question which I shall consider at present is this : whether it is solely perception which contributes to the enrichment of the synthetical memory. This, of course, is not so, for every comparison is at bottom the beginning

of synthesis and many conscious ideas (conceptions, in the terminology of Romanes) are naught else than syntheses. Moreover, our memory never loses a single one, although they are not always all recallable in the same degree by volition. But it is not this aspect of the problem that I wish to investigate. I would rather remind the reader that the work of synthesis is pursued separately from that of direct perception and without the conscious ego being warned of it, although the synthesis is retained by the individual.

Here to begin with is an example (recorded by Dugas) of synthesis which was being produced long after the first perception.

" I recently heard, in a lecture on the history of Art, the name of Van Eyck pronounced. The name, which was then unknown to me, put me in mind of a sentence I had had to copy when a child and of which I see the model copy before my mind's eye as though it were really before me : " Jan Van Eyck, called Jean of Bruges, invented oil-painting." Thirty-five years have passed since then, and in the interval the name of Jan Van Eyck has never once presented itself to my mind ; it was sufficient to hear it spoken to bring back the line of my copy book ; the sentence first sang in my ear, and I saw this visual image only a moment later."[1]

It is upon the spontaneous synthesis, which is bound to reproduce itself one day, the more so if it is easy to realise and the external occasion repeated often enough, that manufacturers reckon when they insist upon placing the name of their products before our eyes, in all sorts of circumstances. In spite of our inertia, in spite of our mechanism of defence, which reduces the number of useless syntheses and only favours those which may be useful to the individual, we end by establishing a relation between the name that obsesses us and the product which it describes, so that a psychic path is established which we make use of without any act of will directly we are in need of the much-praised merchandise.

[1] Cf. L. Dugas, *La Mémoire et l'Oubli*, p. 71, *op. cit.*

Here again is a case of deferred synthesis. I am taking a holiday at the seaside, and while making some notes I find that I need a book which has been left at home. All at once I remember that Freud has recorded, in a certain passage of his *Interpretation of Dreams*, that he, too, was once in the same case. (I see the place of the book where this passage stands with its exact situation on the page.) This is probably the same with all writers: they suddenly remember to have met with an analogous case in a certain book, although it did not especially attract their attention when reading it. This is not the simple case of a recollection that has been revived, it is a real synthesis which is performed.

I further reproduce, in a condensed form, a day-dream from my own collection, which will at the same time serve as an illustration to what I wrote about on the subject of original syntheses.

I leave the house, and when I am about a hundred yards off I suddenly stop to think. Indeed, I have just had an idea that pleases me. Faithful to my habit I immediately retrace my chain of thoughts. As I closed the front door I was thinking of nothing in particular, but I remember that I had hardly taken a few steps before I began to hum a song which I had heard at the age of sixteen, entitled *Comica serenada.*[1] I remember that my friend

[1] This is supposed to be a comic song sung by a Parisian, imitating the Spanish language; in reality it is French, but some words have been given Spanish endings. I reconstitute it from memory thus:—

Comica serenada cantada par un espagnolos des Batignollos a una Andaluza du Boulevard Rochechouardos.

Pendant que ton vieux maritos
En voyageos est partidos,
Je veux te donner, senora,
Una bella serenada,
Mais je crains que ton maritos,
Ne vienne nous dérangeros
Et me flanquer son soulieros,
Au milieu de mon derrièros.
Je n'aimos pas ces blagos-là, etc.

There is an error in the rhythm, because the musical accent ought to coincide, with the accent of verbal delivery, on *blà*gosla instead of blag*ò*s-là.

E. used to enjoy this song because he understood many of the endings as "rosse" instead of "ros."[1] I had not thought of this until he suggested it. He saw a double meaning where I saw none. He, too, is going to get married. His fiancée lives close to the house which I should like to buy. He will have great difficulty in finding a house in F., where he lives. (This town, as it has been partly destroyed during the war, passes across the screen of my imagination, and all the time I go on humming.) When I have come to the last line here reproduced I say to myself: The composer has made a mistake in the rhythm (at *blagos-là*), as my friend C. told me one day. (I see the composer C. at his piano.) Next I reflect that I read in last night's paper a short article about C.'s production. This is an over-determination, as I read this morning in Der Witz, p. 138, "*man verfolgt . . . die Assoziations faden, die von jedem der nun isolierten Elementen ausgehen. (Knoten) Die verflechten sich mit einander . . .*" etc.[2] Consequently I make another discovery; a new analogy between day-dreams and night dreams (*Knoten-Kreuzpunkt*), and I wonder now whether the ideas which I could not put into their proper place in my first reconstitutions were also over-determinations. Anyhow, I shall be able to observe my musings better in future, and my technique for observing myself is improving every day. Here I again go off the track: "I wonder how my friend E. was able, simply by listening to me, to realise that 'blagos-là' meant 'blague' (=joke), for the accent in singing is on 'gos.'" (Here I see E. sitting beside me at the piano and leaning over my shoulder to follow the text, as he used to do more than twenty years ago.) But this again is a shifting of the accent, as children shift it in some of their games.[3]

[1] ros = rosse, pronounced as in cross, is "old horse" or an invective for "woman."

[2] Cf. S. Freud, *Der Witz und seine Beziehung zum Unbewussten*, Deuticke, Wien, 2e Auflage.

[3] When Flemish children play at speaking French (and sometimes Latin also) they use Flemish sentences which they pronounce very quickly, while shifting the accent, as follows:

D'hesp hangt er aan (the ham is hanging on it) because *despanteran* or

(At this moment the day-dream is suddenly checked and I " come to," because all at once I have the intuition that I have made a discovery. In fact, Freud makes of the unconscious shifting of accent one of the principal mechanisms on which he bases his theory of the creation of wit, and, indeed, the shifting of accent often results in a double meaning. And I had just discovered that children do the same for a purpose comparable to that of adults.)

This observation should prove that synthesis need not coincide with the phenomenon of perception, but also that it may proceed without any collaboration whatever of the conscious ego. In the present instance the unconscious synthesis has been brought to a place immediately beyond the threshold of consciousness. But this condition even is not necessary for creating a new synthesis, produced unawares in the recesses of the mind and utilisable by volition. Indeed, this identical synthesis may reveal its existence only after a certain lapse of time. It has been my habit for years attentively to examine my own psychic reactions, and I know by experience that these syntheses return spontaneously at the psychological moment. Very often I have made a note of an idea that has thus involuntarily occurred to me, and then have given no further thought to it. But the same has often returned to my mind a few days later without my recognising it. I could not possibly retrace its origin without consulting my notes. At the outset this phenomenon surprised me, but I now regard it as a case of reminiscence which does not differ from those in which we have registered the idea externally, and as the product of another brain than ours. The above conclusion may still be expressed in another fashion: experience teaches us that just as conceptions formed without the knowledge of the conscious ego cannot be consciously utilized, we cannot make use in the conscious state of the spontaneous synthesis

in feet – – ⏑ – becomes ⏑ – ⏑ –; and *kon er de kat aan* – ⏑ ⏑ – – (if the cat could reach it) becomes *contredecatan* (– ⏑ – ⏑ –) which is no longer understood by the non-initiated.

which the fore-conscious only has registered. Conscious syntheses are at the free disposal of the will, but not the others. (The conduct of Kolnikoff, the hero of Dostoïewsky's novel quoted on page 38, is suggestive enough, and later on we shall examine yet other examples of the same sort.)

For the moment I am content to state that conscious perception is a synthesis of which the conscious ego registers the result, but whose mechanism it does not attempt to discover. Yet we continually make use of this same mechanism of recall : namely, when we use our synthetical memory in view of deliberately chosen actions. This will be the object of the discussion about to follow. Still, before we begin, it will be useful to remember that we are now capable of establishing an initial difference between reduplicative and synthetical memory : an element of the former acquires value for the mind only when it is attached to the series of other memories with which it has been registered, with its immediate antecedent and consequent ; but it has no intrinsic value by itself. It serves to mark a date, a precise moment of the past, or a point in space. It only begins to have any significance at the moment when it is put in touch with the causal law. A mnesic element considered from the point of view of synthetical memory, on the contrary, constitutes part of intelligence, because it is always in touch with some other of the mnemonic elements with which it has been synthetised. When we consider this element by itself we are hardly aware of this relation, or relations, with the contents of memory ; the threads which bind it to its co-ordinate elements are not visible. But it suffices that the mind operates with this same element to make one of these connections appear immediately, thanks to the awakening of another recollection with which it has been synthetised ; and we may in this way exhaust, one after the other, the whole series of relations which exist between one element of memory and all the others which it is capable of recalling.

Mnemonic aids, those artificial imitations of reality,

provide us with the occasion of showing to a fact the theory which we have just explained. We will choose a very simple example, which exposes the two aspects of memory at the same time.

To help the French schoolboys to remember the principal towns on the Seine, between its source and Paris, the following sentence is employed: "*Trois* de *nos gens* portent des *melons* dans une *corbeille* à Paris." (Three of our people carry melons in a basket to Paris.) The pupils synthetise the words in italics with the towns of: *Troyes, Nogent-sur-Seine, Melun* et *Corbeil,* and when recalled this synthesis, based on assonance, is reproduced in the opposite sense. This is where synthetical memory intervenes. The reduplicative memory, on the other side, is placed under contribution because it facilitates the registering and reproduction of the sequence of the words; thanks to a little artifice the sentence has a certain meaning: reduplicative memory (for the sake of a replica of experience) and synthetical (for the interpretation of the assonances) are both cleverely exploited. And, as already stated, the elements of the sentence have—*for the geographical end in view*—no other significance than that borrowed from their antecedents. In the same way the recitation of the multiplication table is not a proof of cleverness; the mind should be able to consider each of its components separately and bring every single one into relation with the special case for which the table is required.

I do not imagine, however, that I am here stating something new. My one care is to remind the reader of the difference between the two forms of memory, before proceeding to the discussion of the use we make of synthetical memory. The latter is evidently greater benefit in the process of conception: without a decomposable memory there is no thinking. This is the question to which we will devote our next chapter. Here we will have to be satisfied with a few considerations relating to the examination of recollection independently of the phenomena of re-association.

In the act of perception the psychic process may

be described as a putting into activity of the memory, by means of the excitations proceeding from environment, and it terminates with the identification of the object which has given rise to the sensation. (We shall not inquire here whether the phenomenon stops there.) But the mind may follow this procedure backwards: it may take memory as the point of departure and end with the above identification. This is what we do when we search for a known object: we proceed from the known mnemonic image toward the sensation. Recognition is thus in a way the opposite of perception.

On the other hand, we remarked above that perception ends in a classification of mnesic elements in accordance with a direction imposed by the nature of the sensation itself. In the case of the electric spark the series successively evoked and established might have entered the category of "objects-liable-to-produce-an-electric-spark."

It is these classifications that the mind turns to account when the occasion arises. My eldest daughter one evening asked me to play a mazurka; I instantly struck up with "La Czarine." The recalling of memory profits by the preceding syntheses, only it departs not from sensation, as is the case with perception, but from the relation which from the background dictates successive evocations of mnesic elements. The psychic accent is displaced, being shifted from the identification of the sensation (in perception) to that of the relation which exists between evoked recollections (in intentional recall), but the effect remains the same, since the appropriate image returns to us. It should, however, be remarked that even in the simple act of recalling the memorial representations which the affect reanimates are submitted to an unconscious judgment, as well as in the process of perception. But in neither case is there any awareness of this estimation. We only obtain knowledge of it when it leads to a negative result; when the evoked image does not correspond with our expectation, with reality; I should like to say: with the unconscious memory of the sensation. The case of Mercier racking his brains for the word *cereus*

and rejecting successively several other names offers a good example of this process.

Coming back to the systematisation of recollections in the memory, we note that most of our philosophical treatises carefully catalogue the connections existing between our mental representations, in accordance with their contents, and we shall not attempt to return to the same subject here.

Still, I would offer the remark in passing that in general the affective relations which bind our recollections are less often mentioned, although as a manner of synthetising it is as interesting as those to which I have alluded. There is, however, no doubt that these affective relations exist. I have a habit of sitting down at my piano when I want some distraction after great mental exertion. I have noticed that when I play by heart the pieces which present themselves spontaneously are all tinted in the same way : all melancholy one day, brilliant and gay another. In the same manner it is remarkable that when we are in a favourable mood we may strike a good vein and say a number of witty things one after another. Some people are inexhaustible in anecdotes of a certain kind.

In truth, we neglect no bond capable of facilitating the evocation of a recollection, and I here reproduce an observation in which a rather curious connection is used ; it will at the same time lead us to a few remarks which I have reserved for this chapter : There is a certain Mr. B. who visibly wishes to please me, but who is of no interest to me ; a sufficient motive for my not being able to remember his name ! Still, I do not wish to seem disobliging, and I think of a means of fixing his name in my memory. I reflect : "In future I must remember the name of B. If I see him I must not forget that he bears the same name as one of my pupils, who, moreover, lives in the same street." A few days later, I see Mr. B. from afar, but I puzzle my brain in vain to remember his name, which obstinately refuses to come back. I then remember the relation established between him and my pupil. But what is this pupil's name ? He lives

in the same street as the man I shall have to talk to. Without being aware of it at the moment I see the visual image of the class-room where I have seen the pupil, and the moment I recognise the boy I remember his name ; it is B !

Let us observe the mechanism of this mnemonic past : My synthetical memory serves me well, in that it brings back to me the recollection of the relation established between the nameless gentleman and my pupil. But afterwards it refuses its services and I have recourse to reduplicative memory, which helps me in its turn.

I reproduce yet another observation to control the exactness of this analysis, for it is not without importance, if only it will explain a fact which psychologists who have treated of memory have not yet emphasised, as far as I know :—

I am dressing to go to the theatre, my patent-leather shoes are not to be found in their usual place. All search remains fruitless. Someone even remembers that unknown workmen have been in the house, and have perhaps. . . . But no ; I remember the circumstances under which I last wore the shoes. It was to go to a matinée last Sunday. I returned on foot. Having opened the front door, I immediately went up to my study, I sat down in an arm-chair, took off my shoes and placed them under the chair next to the mantelpiece, to prevent anyone stumbling over them. So they must still be there, as no one would notice them. So I go to my study and find the shoes where I had left them a week before !

The procedure of recollection will no longer allow the reader to doubt and we shall at the same time grasp the relative usefulness of the two forms of memory. The synthetical memory shortens the mechanism of recall and permits us to go straight to the goal. But when we are unable to reach the looked-for element by a short cut, we take the long way round of recalling the successive stages of the event to which the desired recollection refers ; we follow the replica of the past step by step ; in short, we recur to reduplicative memory.

In the first chapter I have emitted the opinion that this last form of retention presented the most primitive aspect of the faculty of remembering. Here is the time to confirm the fact by pathological cases other than those previously quoted.

"Dr. Leyden possessed an extraordinary faculty for learning languages, and he could correctly repeat a very long Act of Parliament or any similar document which he had only once read. A friend once congratulating him on his remarkable gift, he replied that it was often a cause of great inconvenience to him. He explained that when he wanted to remember a particular passage of some book which he had read he was unable to do so without repeating to himself the whole of it from the beginning until he came to the part which he wished to remember." [1]

It seems that with Dr. Leyden, at least, the synthetical and reduplicative memories were developed in inverse proportion.[2] Professor Grasset mentions the case of his "patient of 1878 (partial verbal blindness) who found the date on the almanac by counting the pages for the months and then the lines up to the day of which he wanted the date." [3]

As far as this particular observation goes we find a total absence of synthetical memory next to a reduplicative memory which still renders service.

At a more advanced stage of the malady the conscious use of the two forms of memory is completely abolished, and the patient becomes the plaything of his reduplicative memory awakened by his affects, or by external circumstances. The first condition is realised by the hysterical Anna O. mentioned on page 17.

Let us reproduce here another extract from Binet :—

"A few minutes later, the patient, with closed eyes,

[1] Dr. Abercrombie, *Essay on Intellectual Powers*, p. 101, quoted by Ribot in *Les Maladies de la mémoire*, *op. cit.*

[2] The fact that he had a great facility for languages confirms the suspicion that their study needs less power of synthesis than the study of mathematics, for instance, because the relation between the divers elements, and above all the causal relations, are less frequent.

[3] Cf. Dr. Grasset, *Le Psychisme inférieur*, p. 129, *op. cit.*

began to mumble some verses of Horace. At that moment we shouted in his ear: 'Soldiers!' The patient stopped his quotation of Horace, and after a few seconds, having mumbled a few unintelligible words, shouted aloud, in commanding accents: 'Forward, march! Right about turn!' Then he opened his eyes, and with a fixed far-away look, the eyelids stretched open, the body bent forward, with a craned neck, he seemed to follow with great attention something that was happening at some little distance." [1] This patient also was the plaything of his reduplicative memory, revived by sensation.

We now shall better understand the significance to be attributed to the observation of Hachet-Souplet, which I have cited at the foot of page 32 and which Bergson explains in the following terms: "With the dog the recollection will remain dependent from the perception: it will only wake up when a similar perception calls it back by producing a like spectacle. . . . Man, on the contrary, is able to evoke the recollection when he pleases, at any moment, independently of the actual perception." [2] We know, too, from the observation of animals which remain in constant contact with us, that they have a certain number of ways of reacting which continually recur; that their life is ruled by their reduplicative memory far more than ours, and that they cannot help reacting in the usual fashion to a perceived excitation: our kitten cannot prevent herself from pouncing upon a paper ball attached to a string which we dangle before her nose. I shall return to this automatism, which differs so strangely from the liberty with which man disposes of his memory, in the chapter upon consciousness.

In the meantime I wish to insist for a moment on the relations which exist between the two aspects of memory. I have tried to demonstrate in the first chapter that reduplicative memory is useful to us, especially, because it permits the mind to estimate, beforehand, the probable

[1] Cf. A. Binet, *Les Altérations de la Personnalité*, p. 60, *op. cit.*

[2] Cf. H. Bergson, *l'Evolution créatrice*, p. 196, Alcan, Paris, 23e édition.

effect of a memorial element which we reanimate with the object of preparing a line of conduct. In practice, any element of reduplicative memory may be the point at which to attach a thread leading to the synthetical memory. In other terms, the two forms of memory may co-exist each without harming the other. On the contrary: to give a concrete idea of the correlation which I have in view I would remind the reader of the long net which certain acrobats stretch over the arena of the circus. At short intervals, ropes are stretched from it in every direction, to connect the next with a large number of fixed points. In our image the net extended in length would represent reduplicative memory; the synthesis would be the cords outstretched laterally and obliquely, each of them leading toward some point of the structure of the circus of synthetical memory. After this attempt to give an idea of the theoretical view, let us see if practical observation confirms it: I am in Ghent at the end of Flanders Street, which I pass through daily, and in the middle of which is the tobacco-shop where I usually buy my cigarettes. Suddenly a recollection spontaneously comes to remind me that I must not forget to buy some cigarettes, as I had decided to do a few hours before. Analysis teaches me that my reduplicative memory has preceded my steps, and on the recollection of the tobacco-shop my mind has bifurcated on the decision previously formed and confided to the synthetical memory.

In short, all these relations between reduplicative and synthetical memory put one in mind of those which exist between what we call outer association (as in assonance) and inner association (following up the meaning), or those representated by the terms homonyms and synonyms. The first constitute a series formed by the hazard of their connection as simple sensory images, no note being taken of their proper significance. (This was almost a case for the formula: *Trois de nos gens portent des melons dans une corbeille à Paris.*)

The second have been grouped according to their significance, no notice being taken of their external form.

In the same way, reduplicative memory does not, at bottom, constitute intelligence as it is commonly understood; the latter begins only with synthetical memory. We shall see later on how to interpret this difference.

There is another point to which I must call attention. It is the fact that the two forms of memory assist each other in yet another way. The most primitive, we have seen, has a tendency to automatic reproduction which hardly characterises the second. But when syntheses have been established (outside perception especially) reduplicative memory has a tendency to secure and reproduce them spontaneously on every occasion. It was to this that I referred above, in alluding to the influence of the precedent. It is this collaboration that gives rise to the annoying mania of certain persons to reproduce certain words, which constantly recur in their conversation. I know one person who on every possible occasion uses the formula "harmony and solidarity," and another who is never satisfied unless he contrives to use the expression dear to Spencer: "the physical, moral and intellectual education." It is on this same mechanism that barristers rely in their addresses to the court, when they seek to guess their opponents' arguments beforehand. We now understand the psychological motive at work.

The education of children is also based on the help given to each other by the two forms of our memory: a piece of poetry must be explained before it is learnt by heart. The synthetical memory is first given material; then it is the turn of reduplicative memory. There is, however, still a tendency in education to abuse the latter and neglect the former. An illusion which is now beginning to fade is the idea that all is done when a lesson has been well explained and then memorised. It is too often forgotten that the mind abandoned to itself does more than this: it dissociates the mnesic elements to reassociate them and make new syntheses. To these there is no end. This last mental mechanism is still too often neglected in school: too many materials are accumulated, instead of being made to reassociate; practice

and combination should follow assimilation in all branches of education. Then a teacher will no longer be surprised if, on the visit of an inspector, the pupil is unable to make a very simple concrete application of a rule which the teacher has with much difficulty enabled him to understand.

In speaking of cases where the two forms of memory give each other mutual assistance, we must not forget to consider the opposite case, where they hinder each other in their respective functions. Our mind cannot perform two operations at once ; it cannot well conceive and perceive at the same time ; at least, if one of the two activities absorbs all the available psychic energy. Similarly it is impossible to recall the past and at the same time attentively observe the present or speculate upon the future. When I am seated at my desk, feverishly writing down the theories which I think I have discovered, I do not perceive what is happening around me : I do not hear the tic-tac of the typewriter, or the barking of the dog when the bell is rung. In the same way, the past never obsesses me at such times. The fact is that my memory is monopolised by the act of continuous thought. All its elements must be ready to the call of synthesis when this is actively proceeding. It is the same when we attentively follow an event which is proceeding before our eyes. When I am moved by a beautiful concert the recollection of the abandoned, unfinished manuscript at home does not spoil my pleasure ; the recollection of a vexing incident which happened yesterday does not trouble me for a moment. And when I intensely re-live the past, no sensation is felt, no thought elaborated ; because in the three cases memory is otherwise occupied, and not at the disposal of other functions. This simple fact explains all cases of distraction, of whatever nature they may be, judging by their external appearance.

I readily believe that psychic maladies, which transport the patient into the past, constitute our unfavourable conditions as regards his present life or his expectations of the future. They limit his sensory field, since reduplicative memory is at work and paralyses the synthetical

memory, which can no longer assist in turning sensations into perceptions. It is probable that in cases of mental alienation which enable the patient to see princes where there are only beggars, the fact suggests a disordered contribution of synthetical memory to the sensation. I estimate, too, that insanity, which builds up an entirely illusory world, is accompanied by a simultaneous obliteration of reduplicative memory. I will hereafter express my opinions of the phenomenon of hallucination.

If asked to define recollecting I might call it a perception without an external object. In the conscious state we are aware of the absence of this external object, and we are not the dupes of our memory, but with a decrease of intensity in this state of consciousness our mnemonic images (auditive, olfactive, gustative as well as visual) become relatively more vivid and at the same time we become less aware of the absence of the external object, until, in the hallucination of the dream and of morbid conditions, a confusion arises between image and reality. The illusion of a one-handed man who refers to an excitation in the amputated fingers is commonly explained by the fact that he refers the excitation to the end of the nerve concerned as he did before his accident. I should use a similar metaphor to explain illusions, optical and others, noticed by normal as well as by abnormal individuals under different circumstances. Synthetical memory has a habit of enrolling the sensations with recollections which contribute to their identification, preceding their integration. I admit that when the conscious ego no longer comes to correct the illusion of our revivified memory—and my study of day-dreams has shown to what strange forgetfulness the loss of consciousness may lead—the mind in the same way displaces memorial images, which ordinarily it sends towards the extremities of our sensory organs, turning them into reality. It makes them occupy the places of exciting objects when their waves come to beat upon the registering apparatus, the fore-posts of our psychic system. Such may be the explanation of hallucination.

The question now arises, What is the exciting agent of our synthetical memory? This is a problem over which we have already lingered in the foregoing chapter; but here we are able to reply to it more definitely. In fact, it was difficult there to show that in reality will awakens one form of memory as well as the other.

When do we voluntarily revive the past? Is it not generally when we wish to make use of it? *The wish* is the element which is never in abeyance when volition applies itself to make the memory work. We have, moreover, in the preceding examples, already met with sufficient instances to be able to conclude that the wish may also awaken recollections without the intervention of deliberate will (see, namely, the observations *Goethals-Goedseels* and *Lanoye-Lanote*, page 58, and *Thomas-Tomatoes*, page 60). Besides, the observation of the higher animals teaches us that with them also wish is always in connection with memory, whereas we adopt the Bergsonian expression of *élan vital* when speaking of the desires of inferior creatures.

We conclude from it that *wish* is the natural evoker of memory, and has become, with man, under the name of will, the evoker over which he disposes at discretion.

This conclusion is, however, far from closing the discussion, as I have already attributed the same rôle to affect in general. Indeed, we cannot ignore the fact that memory may manifest itself not only without there being the least desire to remember, but also against all wish to revive the past. This is the case with *disagreeable* recollections. With this qualificative we touch the bottom of the question: for wish never awakens any recollections but those liable to cause some satisfaction. (It is even possible to live with complacency in sorrow, to find satisfaction in recalling a sad past.) The recollections which invade consciousness against our will always produce a painful impression. We conclude that the mind displays a general tendency to reproduce the contents of memory; that this tendency has led to a double process: the revivification of the useful ones by wish or will; a

defensive mechanism to prevent the re-animation of the noxious ones. But both systems suggest a power of evocation which is primary and external: that which is proper to the outer excitations which are significant for the individual. The external power of evocation is still active in men. About the second system we may add that Freud has developed a theory of forgetfulness considered as an active force, and constituting the alternative of the function of remembering.[1] Next to volition as the evoking power of memory the conscious ego exercises functions of repressing recollection, but in a spontaneous manner of which we have no more knowledge than of the spontaneous awakening of mnemonic elements in the act of perception. This repression reveals itself by its results, and an attentive observation of ourselves is sufficient to teach us that we all possess a pronounced tendency to forget the disagreeable sooner than the agreeable. It is a psychological truth which the vulgar express thus: "If I had promised you a present you would not have forgotten to do what I asked you." In normal conditions the functions of recall and repression maintain a just balance in the mind. They seem two antagonistic forces which should dispute with each other the possession of the field of consciousness, a struggle which ends normally by the subjection of reduplicative memory. But this state of unstable equilibrium, between recollections rising up spontaneously and the antagonistic forces destined to repress them, presents another aspect which is more familiar to us. In fact, reduplicative memory not only brings up against our will experiences which have not been synthetised; it may also invade the field of consciousness by slipping in recollections of thoughts, of formerly co-ordinated syntheses, which we try to repress.

In case of failure in accomplishing this, we at least succeed in hiding from the persons about us that these recollections obsess us, and in keeping them away from the entrance

[1] Cf., namely, the five chapters relative to forgetfulness in *Psychopathology of Everyday Life*, by S. Freud, Fisher Unwin, London, 4th edition. 1917.

to motility. But as soon as the degree of consciousness is lessened, be it by distraction or by illness, we return to an animal stage, for recollections invade the motor-system. Forgetting considered as a psychic activity seems to accomplish a double rôle: it guards the access to motility and proceeds to the repression of recollections into the darkness of the unconscious sphere.

But this double mechanism of inhibition is not applied to recollections only. It may also be used to drive back and annihilate affective ideation which is produced beyond the threshold of consciousness and without the intervention of will, often even in spite of the efforts of the conscious ego. We always have hidden thoughts which we are careful not to give away; we have painful ones sometimes which we try to suppress totally. But it may happen that "the word goes further than the thought," which means that we have let ideas pass into the motor system which it would have been better to censor, to silence. And, let us remark that these ideas are always of an affective nature. We provisionally conclude from this discussion, although we shall return to it later on, that memory has a tendency to awaken spontaneously, be it in its reduplicative form or in its synthetical form; that the individual uses this tendency for the recall of agreeable (or useful) souvenir, and that the evoking agent always appears to us in the form of a wish, at whatever degree of mental development it be considered: and there exists just as spontaneous a psychic activity, which we sometimes call repression, sometimes oblivion, which is directed toward the disagreeable (or useless) side of the spontaneous revivification of our two forms of memory.

Before passing on to another order of ideas there remains to be examined the question of the genesis of synthetical memory. It is a very difficult question, which it is impossible to solve in a few lines. However, I will try briefly to explain my point of view.

We should certainly be nearer to the solution if we succeeded in discovering the real nature of perception.

Following a well-known opinion, and one held by Schopenhauer, Spencer, Hartmann, Wundt, Helmholtz, and lately by A. Binet,[1] perception is an operation of reason accomplished more or less unconsciously and even automatically.

I, too, share this opinion, but I will explain my reasons for doing so. I believe that it is possible to throw more light upon the intimate nature of perception by the comparison of the perceptive process in two different states of consciousness.

The Folkestone day-dream offers an example of fore-conscious perception: the visual image of the board on the luggage-van provokes the release of the reduplicative memory: I live last year's experiences over again, but the relation of greatest interest to us under the given circumstances is not recalled: namely, that which exists between the meaning of the board and the direction the train will take. In full possession of our intellectual means we know without deliberation that the word Folkestone on such a board represents a whole concept: it is symbolical, for it means: this part of the train goes to Folkestone. It is a relation comparable to that which I had established between the name of Mr. B. and that of my pupil, a relation characteristic of synthetical memory. In the fore-conscious state in which I am, it is precisely this symbolical relation which is not reanimated. But none the less, at a certain moment, I end by wondering: Would that be the train for Folkestone? Instantly I understand the reason of our prolonged stop at an intermediate station and the reason of the shunting, of which the meaning had escaped me because it did not interest me: the train has been divided and I am seated by mistake in the wrong part. But then the conscious perception is effected and I hasten to act accordingly.

This short analysis shows why we admit that conscious perception includes an act of reasoning. It includes the revivification of the relations which synthetical memory registers and leads to an inference which escapes

[1] Namely, in chap. iii. and iv. of his *Psychologie du Raisonnement.*

the conscious ego. In the same way, we have seen that the sensation produced by the electric spark immediately awakens the causal relation and it is this which orientates the revivification of successive recollections, serving to identify the exciting object, as in the above case. It would seem possible to conclude that there is conscious perception whenever there is identification of the external object (or tentative identification) consecutive to the awakening of a relation, which unites the same object, to its corresponding mnemonic images. Only, these elements are not yet sufficient to permit us to define a conscious perception, as the same conditions are valid in fore-conscious perception : if we read a newspaper in the street we automatically avoid all obstacles without consciously identifying them, and without being able to enumerate them, should any one ask us. Still, we have perceived them, we have established their nature, as in the case of the electric spark, as our conduct proves ; but this perception has not crossed the threshold of consciousness : we have made what we call a fore-conscious perception. We will examine later on whence comes and of what consists the difference between perceiving consciously and fore-consciously, but in the meantime I will remark that the phenomenon which I have just described is singularly close to what we may imagine as being the animal's way of apprehending its surroundings.

A perception, conscious or fore-conscious, thus includes a spontaneous judgment, an automatic discrimination based on synthetical memory. But the phenomenon does not stop there. When sensation has become perception the unconscious reasoning provokes a muscular reaction (avoiding the obstacle ; jumping into the train) or the formation of an idea, immediately or not, followed by a movement (stepping into the street I notice that the sky is cloudy, it might rain and I should do well to retrace my steps and get my mackintosh !) ; or better still the recollection is preserved for use on another occasion. In every case which we might thus consider (I intentionally do not exhaust the discussion at this point) we should

be led to conclude that perception becomes cause. This is an acquired point which will be useful to us in the examination of the phenomenon of conception.

Synthetical memory then becomes an accumulation of elements liable to become cause. This hypothesis is confirmed on the other side by the analysis of the mechanism of perception. Indeed, to take the case of the electric spark, I am hardly warned by my sensory organs of what happens in the outer world, but my mind enters into activity as if the question had presented itself: What is the object that causes this excitation? In the same way, in the observation relating to the Folkestone train, the final perception ends in the spontaneous discovery of the answer to this question: For what reason has the inscription "Folkestone" been put up on that luggage-van? In one way or another, what seems to arouse our brain in activity is the search for the cause, exactly as in the law of recurrence. But there is more still: each element of synthetical memory which is brought to the surface is submitted to a particular proof, which permits the mind to judge whether it corresponds with the external reality; and in this appreciation it is still its causal relation which constitutes the touchstone.

The example which occupied us above, that of the electric spark, successively called up: the recollections of an arc lamp, of a tram-car, of an electric train. When the image of the arc lamp is recalled, it at once brings the recollection of what its spark may be like, its noise, its flash, the position it occupies in the railway-station; all this is compared with the present circumstances, which must be recognised. It is the same with all other images. This amounts to saying that we consider the effects of evoked recollections as experience has taught us to regard them, or, in other words, that we have recourse, albeit in an abbreviated manner, to reduplicative memory, which, as we have seen, places effect next to cause.

In conclusion we find that, to arrive at a synthesis, to provide material for synthetical memory, we recur to reduplicative memory as a means; it is this which serves

as basis, as test, as touchstone. We still give utterance to the same idea by saying that the synthetical memory constitutes the quintessence of reduplicative memory.

This explains why we call the latter to our aid when the former is of no use to us. We also find a confirmation here of the hypothesis that reduplicative memory is the most primitive form and is at the base of synthetical memory. Lastly, it also results from this discussion that it is the former which we shall have to take as a starting-point in the attempt to reconstitute the history of our mnemonic functions.

But before entering upon this subject let us return for a moment to a question which we have been unable to emphasise in the course of the foregoing argument, but which deserves to be more closely examined. We have seen that while the several psychic operations, provoked by the action of the outer world, are accomplished so that they result in a synthesis called perception, the mind at a certain moment has recourse to reduplicative memory, which is revivified in abbreviated form to permit the appreciation of the probable effects of the synthetised remembrance which has been re-animated. However, there are cases where the mind is not master of itself, where this resource, instead of providing a short cut, provokes the unrolling of the replica of experience with all its details. Such is the case in every day-dream, as we remarked at the beginning of this study, and probably in the abnormal cases which we examined in the first chapter, to prove the existence of reduplicative memory, its nature and its functions. The predominance of this form of memory would then only be the exaggeration of a normal function of our psychic apparatus. In truth, this finding only slightly shifts the limits of our ignorance, and explains nothing, but it affords none the less a partial satisfaction of our scientific curiosity.

I may now proceed to explain my manner of conceiving the development of synthetical memory. To coin a first link let us remember that perception is independent of the phenomenon of consciousness: it is produced at all

stages of psychic evolution. Man enjoys the privilege of being able to perceive in the fore-conscious state, but as we have already seen before, his perceptions are often erroneous. These mistakes are due to two principal causes, the effect of which accumulates. Let us return to the observation relating how I believed I had read on the envelope of a letter the word *réclamations* instead *inhumations* (Cf. page 61). I immediately acknowledged that it was only a *stray* glance that I had directed upon the envelope. In fact, the outer world did not interest me at that time, for all my attention was spontaneously turned towards the ideation which was proceeding across the threshold, with the result, which I have communicated. Here is the first circumstance which favoured the production of the error. To perceive well we must concentrate all our attention and not divide it in favour of two different preoccupations.[1] On the other hand we have seen that the recollection which the word *réclamations*

[1] I have, however, already made the remark above that in dissociating the psychic current, in scattering the attention on different objects, we introduce a cause of error. This remark is not without significance for experimental psychology. In fact, it shows the weak side of all experiment where the subject has to occupy his mind with two things at a time. Let us quote as example the following remark of MUNSTERBERG : " The author has made investigations as to whether successive associations are still possible when one excludes the performance of the accompanying movements as well as the simultaneous perception of the neighbouring terms of a series. . . . The first series of experiments consists in reading letters, then, when they have vanished, to repeat them as precisely as possible. One may succeed with series of 5 to 10 letters. The series from 4 to 7 letters is repeated exactly, without exception ; farther on, there are some mistakes.

" The second series of experiments consists of proceeding as before, but while fixing his look on the letter, *the subject must perform aloud some mental calculation* (example : add 7 + 7, etc.) until the last letter appears. In this case the series of 7 letters cannot be exceeded : in the series 6, a third give one wrong letter ; with two-thirds the reproduction is correct.

" In a series of 100 experiments with 4 letters, we have 6 wrong letters, but in 52 cases the order of reproduction is erroneous. With 5 letters there are 64 cases of wrong order ; with 6 letters 83 cases (examples : *l,g,h,t* instead of *h,g,l,t* ; *c,p,t,s,e,* instead of *p,s,t,c,e,* etc. Is the difference of the two cases to be attributed to the *intervention of attention ?* " The author rejects this hypothesis ! (Cf. *L'Année Psychologique*, tome iii. p. 458.)

represents was emphasised by a certain sum of affect, a second circumstance aggravating the effects of the first, for thus the affective recollection of a disagreeable nature was falsely recognised as being the exciting object, whereas it bears only a faint ressemblance to it. Now it must be remembered here that the function of the mind which consists in bringing back certain mnemonic elements is accompanied by that other activity, which consists in maintaining in oblivion, or in the latent state, similar elements constituting the series we have dealt with at length above. It seems that a part of psychic energy is applied to prevent the revivification of useless recollections, while the other on the contrary dives as it were into the depths of memory to bring up the elements required by the case.[1] It is precisely when we are distracted,

[1] This psychic operation, of which the result is, in brief, to replace a complete revivification of an experience by a partial revivification of the sole elements required for actual needs, and which leads to a great economy of energy and time, may be put in parallel with the theory of RIVERS, relative to the forgetting and recollecting of conscious experience. He bases the latter upon the following observations, which I wish to reproduce here:

"Head and Riddoch have observed a number of patients in whom the spinal cord has been completely divided, and in these cases have been able to study the functions of the lower end of the spinal cord when isolated from the rest of the nervous system. In such cases they find a peculiar form of reflex with characters unknown when the nervous system is intact. The reflex shows itself in movements, chiefly of flexion, involving mainly the stimulated side of the body, but far more widespread than is the case with the reflexes of health. The reflex can be produced by stimulating almost any part of the limbs or trunk below the site of the injury. The nature and extent of the movements does not vary with the locality of the stimulus as in normal reflexes, but is of much the same nature whatever the stimulated part. Moreover, the movements of the limb and the trunk muscles are accompanied by sweating and contraction of the bladder. This form of reflex has been called by Head and Riddoch the 'mass-reflex.' They note that such a mass-reflex would form an excellent answer to noxious stimuli in the lower animals. Owing to the necessary conditions of their observation, the movements are limited to part of the body, but similar movements of the whole body would tend to remove an animal from noxious stimulation. The 'mass-reflex' has a general character and shows an absence of discrimination and localisation which reminds us at once of the characters of protopathic sensibility. The special feature of interest from our present point of view is that this diffused and generalised reflex is wholly suppressed in the normal human being, the suppression having

when a part of the psychic energy is used by cryptic ideation, that there only remains a fraction of it free for the performance at the same time of this double function: (1) the repression of undesirable mnemonic elements and (2) the revivification of elements which collaborate with perception, accomplished simultaneously with cryptic ideation.

The three psychic operations which occur at the same time—revivification of mnemonic elements in view of subliminal conception; repression of undesirable recol-

taken place in favour of reflexes delicately regulated according to the locality and, to some extent, according to the nature of the stimulus. Here, as in the case of protopathic sensibility, the suppression has been so complete that the presence of the mass-reflex is only revealed by disease or injury. It has been so successful that it needed the vast scale on which injuries of the central nervous system has been produced during the war to enable Head and Riddoch to discover the presence in Man of these old and long suppressed processes.

"In this case, and in protopathic sensibility, we are not dealing with the suppression of individual experience, but with the suppression in the race of experience belonging to the earlier phases of its history. Through a special experimental procedure or through the accidents of war, it has been possible to follow the suppression of this experience in the individual.

"The fact that this is possible suggests that the racial suppression is represented in every individual as part of the recapitulation of the racial history. If this be so, however, the suppression takes place at so early an age that its detection is impossible. It would never have been suspected if the experiments and clinical observations of Head had not pointed the way thereto. . . .

"The special importance on the reflex and sensory-motor levels is that it reveals clearly the biological significance of the process. The exact localisation of fully developed cutaneous sensibility would be impossible if the early radiation and distant reference of the protopathic stage persisted. These features would furnish elements of vagueness and confusion wholly incompatible with the exact power of localisation which developed later and enabled the animal to modify its behaviour according to the nature of the external object by which the sensations were being produced. It is essential that reactions founded on the exact discrimination and localisation rendered possible by the epicritic system shall be prompt and definite. This would not be possible if the properties of the new order of sensibility were continually being complicated by sensations characterised by the old vagueness and the old exactness of spatial reference."

Cf. W. H. R. Rivers, *Instinct and the Unconscious*, pp. 28–30, Cambridge University Press. 1920.

A comparison of the two forms of memory with these two forms of sensibility is highly suggestive.

lections ; revivification of elements useful to perception—lead to products of inferior quality : the conceptions have no real value, the perceptions may be erroneous. Besides, we have seen that the principal error in fore-conscious perception consists precisely in the recall of an inadequate recollection, uniting these two conditions : a faint resemblance to the image of the exciting object, and to carry at the same time a disagreeable, or at any rate, an inopportune affective accent, undesirable from the conscious point of view.

This new analysis presents the advantage of making us see the influence of our affects in psychic conditions, which are not marked by the predominance of a will sure of itself and unencumbered by emotion. We are thus led anew to recall the influence of our sentiments on the special orientation of our perceptions as we did at the beginning of this chapter, and the errors which consist in seeing *réclamations* instead of *inhumations*, or hearing, *Buenos Ayres* instead *Winnezeele*, etc., are only an attenuated form of the mania, proper to persons afflicted by an infirmity, qualified as ridiculous by the vulgar, of hearing and seeing at any time and out of time allusions to what is the object of their eternal chagrin.

This peculiarity will help us to understand the phenomenon of perception with animals, which are beings without will and are moved in the first place by their affects.

The question which I would now submit to an attentive investigation concerns the problem of knowing how we may imagine perception to proceed in a being whose external manifestations show in the normal state a marked predominance of reduplicative memory.

To give ourselves some idea of how to proceed, let us turn to the child to whom all psychologists ascribe a reduplicative memory that is relatively greatly developed. Let us suppose a baby, which, thanks to the processes which we have discussed in the foregoing chapter, has discovered the causal relation between his mother and the satisfaction of his hunger. It will apply this first knowledge to all persons susceptible of giving him any

satisfaction, just as at a more advanced age the child admits amongst his uncles or aunts any stranger who procures him the small pleasures which these relations are wont to provide. In other terms, the child assimilates without finesse of discrimination. It is content with a vague resemblance (as in fore-conscious perception) and applies to the class which it establishes between external objects, the name, the knowledge it has in the first place acquired. As the contents of its memory are very poor it does not establish delicate distinctions, it proceeds *grosso modo*, and synthetises later in a more subtle manner, establishing, later on, some very specialised series among the elements which it has assimilated. The lack of precision, the doubt, the *quid pro quo* of fore-conscious perception is found in the child. In the latter, too, a faint resemblance (which often surprises the grown-up by its unexpected character) suffices to induce it to classify experiences together, which later on it will carefully keep apart. Its first recollections serve as patterns on which it models its first syntheses. But between the often quaint similitude of the fore-conscious perceptions of the adult and the no less queer ones observed in children, there is a fundamental difference. In the first case this is due to a temporary impotence of the conscious ego, to the predominance of affects having free play ; with the young individual, on the contrary, this insufficiency is inherent in his ignorance. He disposes of only a few psychic elements for synthetising. He is in the situation of the primitive who is pleased with clumsy images, and far-off likenesses, because his art is not yet refined. His brief experiences, his little trained organs, and the outer circumstances, which tend to postpone the moment when his will undergoes the effects of the hard law of necessity, all work together to reduce his opportunities of comparing the similar with the similar. But he is born with spontaneous tendencies of which one impels him to register the experiences while looking for the causes, while the other incites him to recognise the similitude of things. (We shall see later on that these two tendencies may be reduced to a single one.)

Then logic itself shows that, before establishing a comparison between two mnemonic elements, one of these two at least must have been recognised, have been assimilated previously. Such is the rôle that we attribute to reduplicative memory. And, in fact, upon looking again, we remark that the first notions, the first recollections of the child, his first mnemonic elements, are all to be connected with the causal relation, the utilitarian principle : the mother, the nurse, the milk-bottle, the father ;—in short, all the causes of his welfare.

But I must here open a parenthesis to present the following remark : from this discussion it results that the two forms of memory appear simultaneously in the child. And, indeed, as soon as it is able to communicate with us, we may observe that it synthetises, establishes classifications in its perceptions. This seems to contradict our thesis of the anteriority of reduplicative memory, but only in appearance, for we do not lose sight of the fact that the ontogenic recapitulation does not present a faithful and unaltered image of phylogenic history ; besides, it is a subject of discussion to be continued later. What is important to emphasise at this moment is the fact that the synthesis of children is based upon reduplicative memory. This, however, is a statement which many psychologists have made before, though they have not expressed it in the same terms. Thus Baldwin, who writes :—

The child begins with what seems to be a " general." *His earliest experiences, carried over into memory, become general copies* which stand as assimilative nets for every new event or object. All men are " papa, " all colours are " wed," all food " mik." Professor Cattell informs me that his little girl, after feeling pain from certain " bumps " on the head, etc., got to calling all bodily pain " bump-bump." And her little brother further generalised the term to apply to all mental discomforts, such as disagreeable emotions, fears, etc. . . . Each experience of man evokes the same attitude, the same incipient movement, the same sort of attention on his part as that with

which he hails " papa." In other words, each man is a repetition of the papa copy, and carries the child out into action just as his own early response to the presence of the real papa carried him out. But, of course, this does not continue. By his learning new accommodations, by having experiences which will not assimilate, that dominancy of habit is, in part, counteracted ; his classes grow more numerous as his reactions do, his general notions become more reasonable, and he is on the proper way to a " rectification of the concept " (I would say " of synthesis ").[1]

This is my only comment on this quotation : When the child decides to call a man " papa," it is as if it had first questioned its memory, asking " What produces an impression similar to that which now infringes on my retina ? " and as if the image of his papa had come back to him.

I should like further to quote, in support of my thesis, an observation of Taine's, which also shows how the child departs from causal notions, that is, from his reduplicative memory, when he begins to synthetise. The author relates how a little girl of eighteen months, running round her mother playing hide-and-seek behind a curtain, said " cuckoo."[2] Moreover, when her food was too hot, when she went too near the fire, or to a candle, or when the sun shone, she was told : " It burns ! " One day seeing the sun disappear behind a mountain she shouted out : " It burns, cuckoo " ; showing by this at the same time the formation and the assemblage of general ideas, not merely uttered in words which we do not use (and, consequently, by no other words than those she had herself used formerly), but which also corresponded with ideas, and consequently with classes of objects and general characters, which in our case have disappeared. Hot soup, the fire in the hearth, the flame of the candle, the heat of the day in the garden, and finally the sun, made

[1] Cf. J. M. Baldwin, *Mental Development in the Child and the Race*, p. 309, Macmillan & Co., New York. 1906. 3rd edition.

[2] Coucou = bo-peep.

up one of the classes. The face of the mother or nurse disappearing behind the curtains, the sun behind a hill, formed the other class."[1]

The starting point " it burns " as a cause of synthesis is especially important from our point of view.

Let us remark in passing that language seems to lend facility to the young individual in its first syntheses, because it permits him to put a name to, consciously to identify, the class which he spontaneously establishes. His language at the same time permits us to understand his mental mechanisms more easily ; it is precisely the absence of the means of communication which renders more difficult the comprehension of the processes of animal intelligence. Thus we may wonder how to interpret the phenomenon on which Hachet-Souplet lays so much stress : " The trainer is able to determine, with the greatest variety of animals, associations by resemblance. When he substitutes for a napkin, which a horse is able to bring back, an object which resembles it, or which merely occupies the place where the napkin is usually placed, and gets the animal to bring it back, an association by resemblance has been established. The horse reproduces it afterwards because it is rewarded, but the first time his association is based upon analogy and makes him commit a kind of psychological error : he did not distinguish the first object from the second."[2]

Perhaps the explanation of this phenomenon is as follows : The trainer uses without knowing it one of the processes of synthesis peculiar to the animal. We have formerly seen that the mind has a tendency to look for the cause of the effects which the organism undergoes ; causes placed at the critical moment of experience. The first thing which, theoretically, the reduplicative memory permits is the recognition of the same cause as susceptible of producing the known and feared or desired effect.

Whereas causal relations seem to play such an important rôle in all our psychic manifestations, one of the first

[1] Cf. H. Taine, *De l'Intelligence*, p. 18.
[2] Cf. Hachet-Souplet, *La Genèse des Instincts*, p. 174, *op. cit.*

syntheses to enter the mind may have consisted in recognising slightly different causes producing the same effects: in which case the instance of the child communicated by Taine would acquire a profound significance: it has synthetised the different forms of heat of which it knows. In other terms, it is in their quality of objects able to produce like effects that it has lined them up in a series. (The horse which brings back different objects does the same thing). Similarly, we may admit that the same cause having resulted in different effects, according to circumstances, these phenomena have given rise to another synthesis: that of the effects. (It is such a synthesis that the child makes in the above observations calling out " Cuckoo "—the disappearance of the mother or nurse behind a curtain and the sun behind the hill. In the same example we notice also that two syntheses are associated in the utterance a childish judgment.) The reduplicative memory of the animal may have led it, in accordance with our reasoning, to the synthesis of the initial images of the chains spontaneously registered by its psychic apparatus, and of the terminal images.

But we may also imagine that the synthesis has taken as its object one of the images situated toward the middle of the memorial film. A comparison will concretise this thought: it may happen that a person is talking to an impassioned and abstracted listener, who does not even hear what is said to him, who does not follow the argument, so absorbed is he by his affective ideation, which proceeds without his being able to repress it, owing to his brooding over thoughts of revenge or preparing a reaction. But all at once, in the middle of an argument, the man seizes on a word (at random as far as the speaker knows) and thereupon starts off in a direction quite unexpected by the one who has uttered it. All the foregoing part of the discourse is passed over without penetrating his brain, but he has perceived, has synthetised, a word which makes him break silence, following the nature of his feelings a(s in a cock-and-bull story) ; he then continues to react in the direction of his synthesis. So it may

happen that at the Opera children or uneducated people have not understood the action pursued on the stage, and at a tragic situation they only grasp the comical side of things and laugh where they ought to weep.

In the same way we may imagine that the animal only seizes, from the events occurring about it, those images or circumstances which interest it from its special point of view. In other words, it need not necessarily be the beginning or the end of an action which the mind of the animal assimilates. But the result which is obtained is of primary importance, as it ends at a selection made by the psyche amongst all the details of experience, a selection made from the view-point of the individual interest of the animal. It is for this reason that I have written above that synthetical memory is essentially ego-centric. This selection simplifies the work of the brain in registering, as the rest of experience is not synthetised, and at the same time the desired useful retention is reduced to a minimum.

On the other hand, for new syntheses only the selected image, which alone carries the psychic accent, will be used. It is obvious that the influence of the affects is much less noticeable in man than in psychic life at inferior stages. Our superiority consists precisely in that we can dominate our affects, and it is proportioned, we may say, to the degree of perfection which we individually acquire in this mastery. We can force our memory to serve us in circumstances which, far from being interesting, are intimately repugnant to us: we may impose silence on our sentiments, and freely direct our synthesis as far as to use speech "to hide our thoughts." But the general experience of man, our own, teaches us how the throne from which we exercise control over our affects "rests on a volcano"; and how true are the words: "Passion is victorious animality. It is the blind heredity which darkens intelligence, conquers it and subdues it to its service; it is the suppression in us of humanity, the abasement of what is at the same time our happiness and the reason of our existence; we take rank, while it lasts,

in the zoological series."[1] We take the word " passion " in its broadest meaning ; it then includes the affects of which we are not aware and which are at the origin of the mental diseases.

I have thus succeeded in giving a first sketch of the history of memory as I conceive it. To achieve the task which I proposed to undertake at the beginning of this chapter there remain only some general remarks to be offered.

Perception appears as one of the means of which the mind disposes to establish relations between the outer world and the innumerable elements of memory, between the ego and the non-ego. But this process of synthetisation offers this peculiarity : that it is called into activity by the outside world ; it is thence that the excitation starts which sets our mental energy on the move. It has for its result the assimilation of the outer world with its qualities judged from the egocentric point of view. " No doubt the matter of our representations is furnished by sensation ; but this matter is in reality only the occasion for intelligence to form representations, not in accordance with what the senses impose upon it, but in accordance with its own dispositions." [2]

On the other hand, we now clearly understand through which mechanism it is that the outside world enriches the mind. The syntheses provoked by the surroundings are precisely those which we put to use in conception. That is to say, environment is the source of our intelligence. However, the mind assimilates it, stamping it with an individual mark. But it is still thanks to the personal tint which the representations of reality receive from the psyche which registers them that it is possible for the mind to re-employ them, becoming in their turn the cause of synthesis in the act of conception, as I hope to prove in the next chapter. For here especially lies the fundamental difference between perception and concep-

[1] Cf. J. Payot, *L'Education de la Volonté*, p. 18, Alcan, Paris, 37e mille. 1920.

[2] Cf. G. Dwelshauvers, *L'Inconscient*, p. 83, Flammarion, Paris. 1919.

tion. The same mnemonic elements are used in both cases but the initial cause is now an external, now an internal factor. Conception, moreover, tends toward reaction against the surroundings; perception prepares for it. But between the two phenomena the correlation is such that the one may provoke the other: perception most frequently leads the mind to conceive; inversely, perception, on the look-out for circumstances, may result from conception.

This discussion has also enabled us to see how right Ribot was when he wrote that "perceptions are the fundamental form and the source of our knowledge in all its stages"[2] . . . and that "synthetical activity consists in the perception or discovery of relations."

Similarly, he was quite right to affirm that "what imports as the basis of memory is not the modification imprinted on each element, but the manner in which several elements are grouped to form a complex. "We might even go as far as to say that without memory the sensory organs would render us no service, as they would teach us nothing. We should be in a situation which recalls that of a dog in the presence of a microscope. In fact, our senses no longer lead to a perception when memory is otherwise occupied."

Perception thus results from a psychic operation which is in its essence the same in all stages of development, and which is proper to life. We perceive as easily as we breathe. This is the result of a synthesis which ends with a select registering of experience; this registering may sometimes be called up by the influence of an affect, sometimes by the mere influence of will; in any case by the psychic energy of which the subject disposes. But what has not been voluntarily or consciously perceived is not at the free disposal of the will in the conscious state. There is conscious and fore-conscious perception.

In reality, we use this latter, too, in the conscious state, and far more often, I think, than psychologists have

[2] Cf. Th. Ribot, *La Vie Inconsciente et les Mouvements*, p. 29, *et passim*. Alcan, Paris, 2nd édition, 1914.

supposed up till lately. However, we cannot as yet submit this question to a thorough discussion. But the acquisition of the conscious state puts a stop to the subjection of the individual to his surroundings. Man perceives in a great measure when and what pleases him. In the contact with the non-ego he has freed himself of chance, as he has freed himself from the slavery in which affects keep the animal, and he has recourse to his recollections when he thinks fit. However, it is under conditions of affectivity, which we shall examine later on, that they most easily return.

At the end of this chapter I shall also be enabled to state that the definition of recollection as a perception in the absence of the object, although explaining nothing, is yet based on reality, as, after all, every perception of reality is mostly the effect of our faculty of retention. Synthetical memory might be defined as an accumulation of mnemonic elements apt to become causative: that is, provoking the conception or the awakening of reduplicative memory.

Mill defined memory as "a train of associated ideas, beginning with the idea of the past ego and finishing with that of the present ego" [1] and this definition represents rather neatly the general opinion of psychologists. Our analysis has actually led to the discovery of all the elements mentioned by Mill, only it has brought us to distribute them over two distinct aspects of memory. Certainly memory is a chain of representations which continues from birth till death and omits no detail of our experience, small though it be. But this is what we have called its reduplicative form in which the ego plays but a very small rôle, and our intelligence has recourse to it only when all other attempts have failed. The human mind has learnt to dispense as far as possible with this primitive function, which leads it to register everything, even though useless, and reproduce it upon occasion. It has succeeded therein because next to the faculty of global

[1] Cf. James Mill, *Analysis of the Human Mind*, i, p. 331, J. S. Mill's edition.

retention a function has developed which makes a careful selection of the experiences of life. This selection is directed by the ego at all stages of development, to end with voluntary retention and revivification.

The second function has not excluded the first ; it has simply made use of it, and still makes use of it in man. It has acquired so much importance simply because it has pushed the primitive function into the background, so that psychologists scarcely discerned it ; but it is always there, hidden by the development of its rival, as the massive reflexes of Head ; and we make use of it when necessary. It has for its results an economy of psychic energy, and its enrichment opens a possibility of new reactions following a geometrical progression, whereas in the case of duplicative memory this progression is simply arithmetical.

The study of psychopathology in normal individuals proves that synthetic memory is reanimated as automatically, as spontaneously, as the reduplicative (cf. the observations relating to *Goethals—Goedseels, inhumations—réclamations*, etc.), so that we have been able to infer the existence of a function of repression, of forgetting, next to the better-known mechanism of recall.

The argument of these two first chapters has nowhere insisted on the necessity of looking upon repetition as a *conditio sine qua non* of retention. In my opinion it is only for conscious reproduction and for records of a symbolic nature (as texts, for instance) that repetition is required. For conscious reproduction : Because in becoming volition—that is, psychic energy which can be guided as we wish—affect has lost much of its efficacy ; then repetition comes to assist the recall, because it results at the same time in the utilisation of the mechanism of reduplicative memory, in recalling syntheses completely, as we have seen above. And as for the records of a symbolic nature, of language : In the course of discussion we have also said something of the symbolic value of language, which enables us to give a concrete form to our spontaneous syntheses as well as to those which we establish consciously.

In fact, the mind does not require repetition to remember, synthetise, and reproduce experiences void of symbolic representation, having their own meaning. This results from the genetic study of memory. Nearly all the foregoing researches had for their starting-point the study of memory, which must retain not only the images representing reality, but the images of which the mind must at the same time remember the symbolic meaning; I should be tempted to call them images in the second degree. Here is a very simple proof in confirmation of this point of view: There is hardly a teacher who has not found that if he has *once* let a boy spell a word wrongly on the blackboard it will reappear with the same mistake in the subsequent work of his pupils, whereas they did not make it before; and further, that he will have a great deal of trouble in making them spell it correctly again; the image is remembered in its wrong form. On the contrary, he may find that the word of which the image is remembered at first sight is not always used correctly as to its meaning. Here repetition is necessary. In other terms, the image is understood and remembered more easily than the symbol.

Lastly, when the mind makes use of synthetical memory to assimilate the objective world, it proceeds in the same manner as when it makes use of our primitive mnemonic faculty: it proceeds from the known to the unknown, from the antecedent to the consequent, from the past to the present.

The theory hitherto developed permits us to understand why a recollection must have been the object of a synthesis before it can really become part of our intelligence. It is of no value for future syntheses if it has not been compared with others, and inwardly put to the test as to its causal value. In the same way we may guess why the experience and advice of their elders have so little influence on youth. It is because an appeal is made to their reduplicative memory only. To arrive at a synthetisation young minds prefer to go through the experience on their own account. This amounts to saying that words do not put their synthetical functions

in operation in the same degree as direct experience; this is due to the symbolic and representative nature of speech. The same reasoning applies to the theory of play, which is at bottom only the learning of causal and other relations, and which no symbolic communication can replace. This is why I am of the opinion of Groos when he affirms that "it is not sufficient to say that children and animals play because they are young, but that youth exists in order that they may play, from the moment when the complexity of the vital functions can no longer be realised by the mechanism of instinct." . . . "Youth is *par excellence* the period of playing."[1]

In our turn we see in play the manifestation of the specific need of making individual syntheses before undertaking the struggle for life, a profound need which is satisfied by no substitute.

Moreover, Groos wrote that "*The joy of being cause* seems to me to be the most primitive psychic concomitant of all games: that is to say, experimentation, which in my opinion may be traced back in all sorts of games, and possesses an importance not yet appreciated, even in respect of the more elevated games, e.g. artistic production and æsthetic enjoyment."[2] And elsewhere: "The pleasure of discovery of causal relations is so much the basis of all games that there exists not a single case in which the satisfaction of being cause does not form the kernel of the pleasure."

The principle which orientates and dominates our synthetical memory is the self constituted by its affects, as we have said; it is from the standpoint of the service which it may render us in the pursuit of our aims that it must be judged. We now understand the profound meaning of the aphorism of Aristoteles: "Passion is to memory what form is to matter."

We will examine in the following chapter what services the synthetical memory renders us in the act of conception.

[1] Cf. H. Groos, *Die Spiele der Menschen*, p. 4, Fisher, Jena. 1899.
[2] Cf. H. Groos, *Les jeux des animax*, vii, Alcan, Paris. 1902.

CHAPTER III

CONCEPTION

Analysis of Conception—Comparison between Perception and Conception: Both use ancient syntheses—The animal is the prisoner of its syntheses, and man of his in a certain degree—Biological significance of this automatism—Analysis of Conception operating in Originality—Comparison of Perception, Conception and Invention—Invention results from an empirical procedure.

In the Introduction I reminded the reader of the three principal stages to which the reactions of the primitive being have been reduced by Baldwin: "Outer excitation—inner process—motor reaction." These are found even at the summit of the zoological scale. If I had to put the foregoing discussions in a nutshell, I should say: We have examined the manner in which the mind accommodates the sensitive images which come to it from the outer world, and we have studied the results of the excitations which our nervous system undergoes. Let us continue this laconic comparison; let us examine in this chapter what should be understood by "inner process," and in the next the "unconscious movements"—which the original motor-reaction has become in man. Lastly, when we have reviewed the different functions of consciousness which rule these different processes, I shall consider my task at an end.

In the following pages, I do not essentially aim at justifying my definition of thought as "the adaptation of revivified recollections to present situation under the influence of an affect or of will." My aim is rather to show that conception is but a synthesis, which borrows the mechanisms that we have seen at work in perception, and makes use of the resulting data. Or else: Percep-

tion being the result of a synthesis provoked by the non-ego, I want to prove that the idea, the thought, the conception is a synthesis provoked by an inner cause, by the conscious or unconscious self.

But I cannot follow Romanes, who uses "the word idea as a generic term which may indifferently mean anything from a product of imagination, of a simple recollection, of a simple sensitive impression, to the result of the most abstract generalisation." [1]

As Ribot holds, "The thought is the superior form of knowledge, superposed in sensorial perceptions and the spontaneous association of images; but to mark its place in the total intellectual activity is not to determine its nature.

"To avoid all misunderstanding the meaning of the word thought ought first to be fixed. It is a general term which may result in more concrete terms, such as *judgment, reasoning, combination, calculation*, etc.

"However, this teaches us nothing. A procedure at once more rigorous and more scientific is to characterise it according to its proper mechanism and its results." [2] It is precisely this mechanism which will comprise the object of the following discussion.

It is generally admitted that to think is to prepare for the future, to prepare the reaction, to consult memory, to control conduct if such or such a case presents itself. In fact, we may apply this point of view to our purely intellectual occupations (I mean those which do not directly tend to an external adaptation), and if we observe ourselves we shall remark, for instance, that we prepare answers to the letters which we have received by the morning mail on the way to our office, etc. The orator prepares his speech in the same way: while his mind is free (absent) during a purely physical occupation; the business-man unintentionally ponders over his affairs in the train, or as he walks to his office; the journalist

[1] Cf. G. J. Romanes, *l'Evolution mentale chez l'homme*, p. 34, *op. cit.*

[2] Cf. Th. Ribot, *l'Evolution des idées générales*, p. 80, Alcan, Paris, 3e édition.

has his article in mind before reaching his office, and so forth. Anyone can complete the enumeration by instances borrowed from his own experience. But the psychic mechanism invariably admits of recalls, of remembrances which are mentally put to the test and then rejected or adopted, to be later associated with others. Briefly, thought is mostly created without the thinker's attention. I do not mean here the finishing touch, the manner of clothing the idea, but the kernel of the concept, which will lend itself to the developments consciously given to it.

For the sake of facility in the analysis of the act of conception, we will proceed as heretofore by starting from observations. The first which I shall reproduce is a day-dream, which presents the advantage of offering a good deal of resemblance to a conscious deliberation and will permit of successive comparisons with mechanisms proper to the state of consciousness, and others which only manifest themselves in the fore-conscious. Moreover, we shall be able to put it in parallel columns with the instances of perception which we have previously communicated, and in the course of which the mind likewise proceeds by successive attempts.

I claim the reader's indulgence, for it places at the centre of our consideration . . . a flea; and I have some scruples in touching upon such an unattractive subject. If, nevertheless, I proceed with it, it is because, of all my observations, it proves to be the most adequate to the aim I have in view.

I am at the front and lying down on my camp-bed. However, a disagreeable excitation, produced by the bite of a parasite, leads me to desert my couch. I relight my candle, and make a conscientious but fruitless search. For to fleas I seem to be a peculiarly popular a host, and I always keep in my bed a bunch of camomile flowers rolled up in a handkerchief. It is a remedy recommended by a peasant. After having examined the bites, to discover, if possible, from the swelling, to which species the insect belongs, I again slip between my

blankets, laying the flowers on the painful spot, while my thoughts begin to wander.

At a certain moment I evidently lost consciousness, but when I awoke I was able to retrace my entire musing from stage to stage. (Everybody is able to do the same, of course, but it is not always achieved so completely, for some practice is necessary.) The phantasy went thus:

"This remedy (camomile) hardly produces any effect, Still, it is useful, for it acts as a suggestion: I feel the bites less when I apply the flowers to them. But it cannot be a flea; the camomile would drive it away. Besides, the swellings are too large and are not of the shape of flea-bites. If it were a bug it would not bite in the day-time. It will soon be a week since I first had it. My attempt on Monday (I had changed my linen to get rid of it) has not succeeded. But the insect may have jumped back upon me. What if I undressed in the next room and ran away? But the landlady might see me And if I undressed here and let it jump on to the stones, perhaps the cold would paralyse it? And I might trample it underfoot (after the manner of gardeners). But it might not be hurt, for a boot does not touch the ground at the instep. And what if I used a gardener's roller? It (the flea) might still escape between the interstices of the flags. But if by staying so long with me it ended in laying eggs? Fortunately, there is only one! But if these insects were hermaphrodite? Ah! it is the khaki colour which prevents my seeing it. If I only had a white shirt! Perhaps I could obtain one in the hospital. Perhaps they would also give me a remedy there. But what if I tried insecticide powder? (I see myself introducing, beneath my shirt, a tube full of insecticide powder). . . . But if the powder produced a skin disease? (Thereupon I wake up with the vague visual sensation of a skin-eruption.)

These are the contents of the phantasy as I was able to reconstitute it immediately upon awakening. It will hardly be believed that it lasted half an hour, but I will

add immediately that it was more quickly acted than thought, for I visualised and played the different scenes as in a dream. The above text merely gives a faint idea of the phenomena which occurred in my mind; it is merely a greatly abbreviated reproduction; like that of a dream which continues all night but may be told in five minutes by omitting numerous details. To make them reappear a long analysis is required, which is only rendered possible by the practice of introspection from the special point of view which I here adopt. But I will limit this operation to those questions only which will be useful as elements of further discussion. As a preliminary, I will remark that we all visualise in our day-dreams, but the images are far less clear and finished than during somnial ideation. Still, if the habit is formed of reconstructing them at once, they gradually appear more clearly.

ANALYSIS OF THE PHANTASY

1. This remedy produces hardly any effect.	Still, it is useful, for it acts as a suggestion: I feel the bites less when I apply the bunch of camomile-flowers.

The first sentence (No. 1) expresses a conscious judgment, giving rise to the perception of the camomiles, felt upon entering the bed. If we render this perception in words: "Here is the remedy which was so warmly recommended!" we may estimate that it was involuntary and immediately compared with the perception of the pain of the bites which made itself felt simultaneously. This comparison leads to the judgment: "This remedy has hardly any effect," an appreciation which we may place in parallel with the conclusion, the judgment included in every perception: "There is the baby-carriage (cf. p. 56).

Let us immediately suspend the analysis in order to compare these two sentences: In the perception of the baby-carriage I first evoke an inadequate mnemonic image (the cow) and then the correct visual recollection of the

vehicle. Without being aware of it, I compare the latter with the sensation, and decide that it is a perambulator that is advancing towards me.

In the above conception I make a comparison between the recollection of the peasant's assertion, included in the perception of camomiles, and the perception (or sensation) of bodily pain, and I decide the remedy is useless. Instead of a recognised object I have a recognised quality. Indeed, we never perceive objects without at the same time establishing their qualities—(for instance: the perambulator *advances towards me, but constitutes no danger.* Remember the memory of the cow, and my spontaneous reaction of halting). We may say that in the two instances which are compared the phenomenon is identical: there is a judgment resulting from the comparison of one mnemonic element with another, or with a sensation. Only the psychic accent is here on an object, and there on a quality. We might argue that there is no fundamental difference, as perception may also apply to the qualities of the objects, but I prefer to abandon the discussion provisionally and take it up again further on, when we shall dispose of more elements to lead up to its logical conclusion.

We thus come back to our analysis, and we note that after the first judgment my mind offers an objection, in which an opposite opinion is expressed. Hardly has the thought arisen: "the remedy is without effect," but the retort comes: "still, it acts as a suggestion," a retort sustained by the recollection of the easing of the pain which the suggestion induced. This contradictory appreciation is, like the first, based upon a mnesic element spontaneously re-animated without the least attempt or intention: the recollection apparently comes from the synthetic memory.

We find again that in this case memory and judgment intervene spontaneously, as in the act of perception. Only the aim of conception does not appear yet; it is, however, only a question of patience: it will clearly

appear later on; we are now only at the preliminary stages of the synthesis which will be effected before our eyes.

The two contradictory statements underlined above also end in a decision which is simply implied in the following passage. The mind understands: yes, the remedy is efficacious, it cannot be a flea which caused the bite. This conclusion is not verbally expressed, and this is the same with nearly all the elements of thought analysed here. It is, besides, this procedure of abbreviation which produces the quickness of ideation. It is from this point of view that the following suppositions should be considered:—

2. Suppose it was a flea!	The camomiles would help; besides, the swellings are too big, and they have not the shape of swellings produced by flea-bites.

The second member of the association analysed here might be called a perception of visual nature continued in the absence of excitation. In actual fact, when the candle was re-lit the bites were inspected. Now, in the dark, their visual image returns, and just as I wondered (in the observation of the electric spark, p. 56), "What can be the object that causes it?" the mind asks itself an analogous question. I have already underlined this persistence of perception in the absence of the object in the foregoing pages, when remarking that the synthesis sometimes operates long after the moment of sensation, and also when I drew attention to the fact that synthesis pursues its course unceasingly from birth to death. I have even recalled it a third time in other terms, saying that conception might give birth to perception, and inversely. We thus abandon the analysis of the second link of the concatenation, for it leads us back to the case of perception, which we have treated before.

The revivified visual image not yet being adequately identified, another recollection, logically connected with

the representation "flea," gives rise to a fresh attempt to solve the problem which occupies my mind :—

3. Suppose it were a bug ?	It would not bite me in the *day-time* ; I have had it for a week. My attempt on Monday did not succeed.

The hypothesis of the bug is at once put to the test, and an unconscious recourse to reduplicative memory tells me that by its known effects this insect does not cause discomfort to its host in the day-time.

The recollection recalled offers nothing striking in itself (except one remark which I reserve for later), but it provokes the awakening of reduplicative memory. The reader is requested to remark that all the mental operations considered here take place in the absence of consciousness without apparent direction, without intention or will. The presomnial period is the one in which fore-consciousness, this intermediary stage between clear consciousness and total unconsciousness, may best be observed. It is in these conditions that from the above recollection the mind glides on to another : "I shall soon have had it for a week ! " And if, as before, we inquire into the nature of the bridge ideally linking these two representations, we discover only the association *day-week.* This is an association which can take place only through a sort of double meaning. For in the foregoing sentence *day* is a synonym of the period during which it is light, and in the association with week it becomes the synonym of a period of twenty-four hours.

This way of distinguishing, without apparent motive, the second meaning of a word is a well-known mechanism of the unconscious which cannot be commented upon here.[1] The spontaneousness with which the word *day* brings about the awakening of the word *week,* with

[1] Freud quotes as illustration of the conscious use of this characteristic mechanism of unconscious ideation this fine repartee : A courtier in the reign of Louis XV was reputed for his wit. One day the King, to put him to the test, insisted that he should take him (the King) as

the complex attached to it, is more remarkable still, because psychological literature does not abound in examples where the fore-conscious, undergoing its recollections, continues to observe the logic which the conscious synthesis introduces into the classification of our mnesic elements. And I profit by the circumstance to remark that we see here, so to say, synthetical memory manifesting itself freely, without any guidance.

In all the foregoing cases each revivification of mnesic elements has a well-determined aim, though it is not the conscious ego which presides over the psychic operations. This aim, after all, is to find a means of delivering the body of the disagreeable excitation, though the subject, half asleep, is not aware that his brain is thinking for him, for he has already temporarily given up adaptation and renounced the exercise of his will-power.

In the passage from the recollection *day* (taken in its second sense) to *week* (with the experience which it represents), it is no longer possible to attribute the awakening of memory to the unconscious wish of adaptation, which only manifests itself by its affects, and which we may recognise as a sort of stage-manager who conducts the action of the stage though remaining " off." We can no longer trace back any motive to explain this leap from one recollection to another belonging to the same series. We can only remark that this spontaneity confirms a hypothesis expressed above, according to which memory has an innate tendency to awaken under the influence of affects, with which we are still imperfectly acquainted. In my conception, this spontaneous tendency is counterbalanced by an opposite tendency of consciousness, which permits us to repress memory, to keep it in check, to maintain it in the latent state, so as to arrive at a delicate adjustment of the mechanism of recalling, which permits access to the forum of the mind only to those

the *subject* of a witty remark. The courtier declined the perilous honour, saying: " I beg pardon, Sire, but the King cannot be a subject ! " Cf. FREUD, *Der Witz und seine Beziehung zum Unbewussten*, p. 27, Deuticke, Vienna. 1912. 2nd edition.

elements chosen by will, and in the fore-conscious state those selected by the wish, of which we are unaware. But for this psychic mechanism to work well a perfect balance is regained between these two antagonistic applications of psychic energy. Indeed, as soon as volition weakens, as soon as the individual ceases to exercise the functions of consciousness we observe the gradual disappearance of the repression which weighed on memory, and the latter begins to gain ground in proportion as the energy at the disposal of the functions of adaptation is withdrawn. Man then returns toward a more primitive stage—which recalls that of the animal, the prisoner of its memory. The latter, in presence of certain excitations, can only react in accordance with certain processes which observation allows us to determine beforehand.

I know that one might possibly object that in the case which we are discussing here it is synthetical memory which seems to awaken, whereas the animal is led by its reduplicative memory; but we already know that the latter phenomenon may also manifest itself in man. We shall, moreover, see more examples further on.

We saw, during this discussion, that when we loosen the reins of imagination our synthetical memory may send us drifting away without aim.

But we must not yet abandon the subject which occupies us here.

After the representation, "I shall soon have had it a week," the mind halts at this other recollection: "My attempt on Monday did not succeed."

We here abandon the question whether the awakening of Monday's experience is due to the series *day-week-Monday* (synthesis) or to reduplicative memory, which would have made us recapitulate, in brief, the whole experience relative to the complex of the flea, from the first day to the last, thereby emphasising that of Monday. This detail does not matter much after the above conclusion, the more so as we shall presently observe the reduplicative memory in full activity.

Indeed, as the text of the phantasy indicates, I have,

no doubt, lived over in imagination the events which occurred last Monday. In my day-dream I see myself completely undressing to change my linen. I witness the operation, as though it had been cinematographed, as though the film were projected on a screen. I see myself bending my head, with lifted arms, in the action of taking off my shirt; in short, in my imagination I witness the repetition of all the actions performed on that occasion. Especially do these visions prolong day-dreams and make them last longer than one would suppose.

There is no need to revert to my conception of recollection as an activity proper to the mind independently of the mechanism of recall (willed or wished), the reader being able to judge for himself of the exactitude of the facts which I submit to him.

However, if I think I may succeed in penetrating a little further into the mechanisms of intelligence than my predecessors, thanks to psychoanalysis, I have no illusions as to the degree of this penetration. I am perfectly aware that the divers recollections which constitute the stages of the synthesis are not simple elements; I do not pretend to have reduced these elements to their simplest expression. On the contrary, each of them represents a complex whose genesis I shall not attempt to find, as it would not be relevant to the aim which I wish to reach. But this remark is necessary to make it understood why at a certain moment, in the course of the unrolling of the replica of "last Monday's" experience, my mind becomes alert again (not aware!) and resumes an active attitude, concluding as regards the scene of which it was a spectator: "The flea must have jumped back on me." This conclusion, which we may still compare with that arrived at by perception ("it is a perambulator advancing toward me"), awakens the wish which we shall henceforth trace back in all the links of the association: the wish to get rid of the pertinacious insect. (In the same way the perception of the baby-carriage led to the inhibition of my first movement of retreat at the recollection of the cow, and brought back at the same time my

intention of returning home, which I had put off for a moment.)

In the text the psychic activity which I have described is rendered thus :—

4. Suppose it had jumped back on me !	(Supposition of which the acceptance is not verbally expressed.)

If we suspend the argument for a moment to throw a glance behind us, we remark that up to now the phantasy may be summarised in the following manner :

1. A conscious judgment consecutive to the perception of the bunch of camomile flowers ; 2, 3 and 4. A succession of suppositions and refutations constituting a reasoning which strongly reminds one of a perception, a synthesis in the absence of the object. These psychic operations have led to this result : that the mind is fixed on the cause of which it perceives the effects.

We shall later on observe the mind searching for means likely to repulse this cause. In other terms, it is no longer the recognition of the external excitation which provokes the mental activity ; it is the desire to ward off the cause of the pain (in a general sense), an anodyne manifestation of the deeper desire for comfort, the tendency to self-preservation, which resumes the reins. The control of the operations is passed on to an internal factor, to an aspect of the unconscious or fore-conscious ego. We may now follow the different stages. Only, with a view to abbreviating this long analysis, I shall not insist on cases which would give rise to the repetition of the above discussions. I shall be content with indicating it as briefly as possible, in the hope that if a doubt arises in the reader's mind he will turn back to the corresponding case in the foregoing pages.

The problem set us by fore-consciousness, the solution of which it henceforth pursues, may be summarised as follows :

How shall I get Rid of the Flea ?

5. Suppose I undress in the next room and run away !	The landlady might see me.

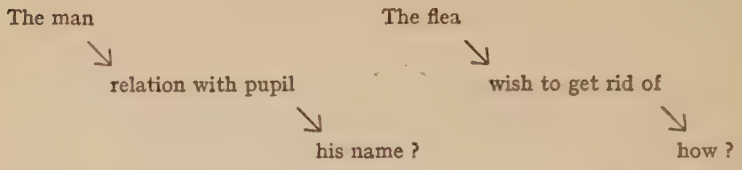
The psychic mechanism which has given rise to this attempted adaptation may be summed up as follows: The mind, instead of starting from a sensation (or from the affect it produces) as in perception, starts from the desire to get rid of, and also begins with an operation which Jastrow compares with that of the diver who tries to bring to the surface an object lying at the bottom of the water, or to the man who casts a dredge to salve some object which he cannot see but which he knows to be there.

This way of fishing, this emission of mental energy directed towards the depths of synthetical memory, succeeds, by a sort of psychic induction and by following the ways of communication traced by previous syntheses, in bringing before the mental eye a recollection more or less adequate to the circumstances; a recollection which will immediately be put to test.

But before examining what this new operation consists in I wish to justify my opinion, according to which it is to synthetic and not to reduplicative memory that the mind has recourse in these circumstances. We have, in fact, already seen how reduplicative memory leads chiefly to the knowledge of causal relations between the elements of a *similar* experience, whereas synthesis establishes relations between the elements of *different* experiences or syntheses retained by the mind. Now which sort of memory is active in the present case? The mind starts from an element: the flea; and a relation: the means of getting rid of it, to find a second element, part of some experience or other. It is clear that reduplicative memory can be of no service in these circumstances, as it can only reveal the past in the chronological order of events.

We may still reason in another manner. I have already described the syntheses which permitted me to trace the name of Mr. B. When circumstances brought me into the presence of this gentleman, the first thing that came back to me was the recollection of the relation which I had established; I then had to find the name of the pupil with which I had connected his. The

mechanism here is like that of the last case, as the following schematic representation shows us :—



In both cases mental energy is set moving (directly here, indirectly there) by an external object, which provokes a wish ; and the latter addresses itself to synthetical memory.

We may even continue this simile. I remember that in the case of Mr. B. the name of the pupil did not at once come back to me : I had to appeal to reduplicative memory in order to trace it. After the awakening of the complex, " to undress," etc., here again it is the latter that intervenes. For as soon as this solution of the difficulty is suggested the mind puts it to the proof, wonders what it might bring forth, in one word, *anticipates*, by representing its consequences as actual experience has taught them to us. It is in thus gauging, in imagination, the distance between the spot where, hypothetically, the act of undressing would take place, and the room into which I should run—it is in unrolling before my mind's eye the replica of reality, that I judge, without awareness, that my landlady might see from her kitchen what was happening in the passage.

Briefly, *after having asked synthetical memory to help me out of the difficulty, I turn to reduplicative memory to test it.*

Of course, the day-dreamer is not aware of these successive operations, but that is not a sufficient motive for denying their existence, as even in the waking state we generally do not see how our intelligence proceeds.

We thus perceive more and more clearly, the further we advance, that the mechanism of conception does not

differ essentially from that of perception. Therefore I propose to interrupt this analysis, after having examined one more link of the concatenation, just to show how the same mental operations constantly recur though the order of their succession is not fixed, especially in the fore-conscious state.

The test to which the preceding suggestion has been put has led to its rejection. For this reason the psychic current is, as before, directed upon synthetical memory and brings back this proposition :—

6. Suppose I undressed, and let it jump on the floor, where the cold of the flags might paralyse it ?	(Supposition of which the acceptance is not verbally expressed.)

The very wording of the question, which I have not altered to suit my purpose, indicates the nature of the reduplicative recollections to which the mind had recourse to put the proposition to the test ; in my imagination I see the cold flag-stones, etc. I communicate below the rest of the phantasy, classified as the preliminary part in questions and answers, without pursuing the analysis, only reserving some final remarks of a general character.

7. Suppose I were to trample it underfoot ?	It might not be touched, for the sole of the boot does not touch the ground beneath the instep.
8. Suppose I were to use a garden-roller ?	It might still get out of reach, in the flags between the interstices.
9. What if it ended by laying eggs ?	Fortunately there is only one !
10. What if these insects are hermaphroditic ?	(Non-expressed but visualised recollections, which lead to the conclusion : my khaki shirt is the greatest obstacle to my search.)
11. Where could I get a white shirt ?	At the hospital (the reduplicated recollection gives rise to the suggestion of another remedy) :
12. Suppose I were to try insecticide powder ?	(Awakening caused by the reduplicated recollection of a skin eruption.)

The observations which I wish to present before drawing conclusions from this analysis are the following :—

(1) From the beginning of the ninth question until the end of the tenth the search for the solution of the problem is suspended. Instead, the mind considers the possible effects of the prolonged presence of the parasite ; it leaves the subject ; it diverges on to a side-track. This phenomenon will not arrest us here. It may be likened to distraction in the conscious state ; to instability of attention in the child ; to the ease with which an animal may be brought from the consideration of one object to another. It is a characteristic of the mind not stiffened by will, and we shall treat of it in the chapter on consciousness.

(2) It is remarkable that during the advance of the concatenation, which corresponds with a gradual falling asleep on the part of the subject, who, from drowsiness, will pass to the complete hypnogenic state, the vivid recollections become more and more absurd.

It is as though he had gradually lost the notion of logic with the disappearance of volition, which, at least in the beginning of the day-dream, seemed to prolong its influence beneath the threshold of consciousness. We get an impression as though the relations between the different recollections—in one word, the synthetical tracks —become of an inferior degree when approaching unconsciousness. I have called attention to a form of inferior synthesis in alliteration and rhyme, for instance, which renders possible the errors analysed on pp. 60–61, and is due to a defective recall of recollections in perception.

I will not insist any longer here on this similarity, nor on the absurd character of the mnesic elements reanimated in both cases. But, in view of the considerations which are to follow, I wish to remark that the means suggested in Nos. 7, 8 and 12 for destroying a flea have at least the merit of being original, though in an extravagant sense. Still, this mixture of absurdity and originality, when will decreases and gives free play to our affects, which

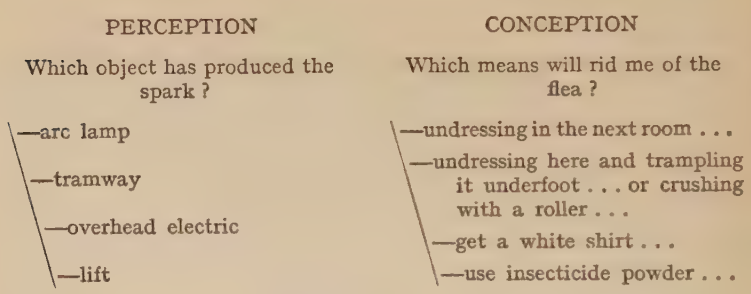
escape from its control, will acquire its real significance when the subject of superior originality is discussed in the second part of this chapter.

(3) The third point which we wish to mark here for future use concerns the end of this phantasy : the dreamer sees in his imagination his skin covered with an eruption, caused by the insecticide powder which he has sprinkled over it, and the slight feeling of dread which this illusion provokes in him causes his return to the conscious state. At least, such is my opinion. We will discuss it further on, when putting the fact in parallel with the phenomenon of intuition, awaking from nightmare, etc.

We may now turn our attention to the phantasy as a whole, and we find that owing to its untimely interruption it has led to no result. There is no fixed rule as to the manner in which these involuntary products of our intelligence terminate. But as I have reported on page 71 an instance of mind-wandering which terminates in a conclusion which our conscious ego registers with pleasure, we may abstain from comment and affirm that in spite of the absence of conclusion the phantasy of the flea is none the less an attempt at conception, a tentative synthesis.

I now propose to comment upon the different conclusions to be drawn from the analysis which we have been considering. We first of all find that conception is a mental operation which associates like with like in view of a future reaction against the outside world. By like elements I understand here recollections which contain elements of the same nature. The recollections evoked in the perception of the lift (p. 56) all have this common characteristic, that they are capable of accounting for the production of an electric spark. Neglecting in the above reasoning all mnemonic elements which are not eventually and in an immediate manner of service in respect of the end pursued by the mind, we may say that they are all characterised by the fact that they may lead to the removal of the parasite. We have thus, as it were, indicated the thread which joins the different

recollections. For the sake of clearness, we may have recourse to a schematic representation :—


PERCEPTION
Which object has produced the spark ?
—arc lamp
—tramway
—overhead electric
—lift
CONCEPTION
Which means will rid me of the flea ?
—undressing in the next room . . .
—undressing here and trampling it underfoot . . . or crushing with a roller . . .
—get a white shirt . . .
—use insecticide powder . . .

Next we find that conception is a synthesis which acts in the absence of any real object. On the other hand, will being completely foreign to the different processes which we have analysed, it remains to us to admit that it is the wish to adapt which has assumed the direction of the operation, the fore-conscious wish which we can trace back, thanks to its results, in the higher animals.

Fore-conscious conception—and it suffices to observe the manner in which our conscious ego prepares for the future to be convinced that this theory also holds good of conscious conception—conception, I will therefore say, is an empirical mental process which permits us, in a minimum of time, to go through all our past experience, successively and in anticipation to line up different attempts to solve a given problem. Originally, and it is still so with individuals who do not pursue intellectual occupations, this problem goes no further than an eventual reaction against the outer world. (We will examine other cases later on.)

To reach this end the mind has recourse successively to the two forms of memory. Thanks to the relations established by our previous syntheses between our mnesic elements, the mind may choose the more direct road to animate the complexes capable of meeting the case, that is : those which present certain characteristics correspond-

ing with the conditions fixed by the nature of the reaction to be obtained.

Thanks to reduplicative memory, it reviews the film of the past, of which the synthetical recollection forms a part, and in this way the probable consequences are appreciated. These are compared with the effect to be obtained, and the mind adopts or rejects the line of conduct which experience suggests.

Consequently conception is a real phenomenon of anticipation based on the past. We have sufficiently insisted in the foregoing chapters on the features which distinguish each of the two aspects of memory; we need not recapitulate the manner in which the conceiving mind makes use of them. I will end with the remark that without synthetic memory we should be unable to anticipate except under *identical conditions*. It would be impossible to use the same mnemonic elements in entirely *different* circumstances. If, on the contrary, reduplicative memory failed us, our faculty of preparing the future would be useless, for we should not be able to subject our premeditated action to any test; we should know nothing of its probable effects.

Fundamentally, in both cases the mind makes use of the same elements, but the manner in which they are associated differs in each case. At all events, however, conception utilises, now reduplicatively, now synthetically, the results of perception. And we are bound to admit here that the use of reduplicative memory, which some authors have regarded as abnormal, has appeared clearer and clearer and absolutely normal as this inquiry has progressed, so that I fear I have not done it full justice in the first chapter. If so, the reader will spontaneously apply the necessary correction to the idea which he has formed of this so long-slighted faculty.

We will at once profit by the knowledge which we have just acquired concerning the mechanism of conception, to cast a full light on the corresponding phenomenon proper to perception, which I have hitherto had to keep in the background, for want of a term of comparison.

That is, we perceive simultaneously in two different ways: on the one hand we register the events in the order of their succession; and as the registering proceeds the mind synthetises the images which provoke a certain affect; that is to say, those which interest it in varying degrees. The parts of the film strengthened by a synthesis are those which the conscious self recalls most easily, as we conclude from the fact that we remember especially the woof of events. But if we examine this woof closely we find that it is constituted of an assemblage of details, which to a third person may seem insignificant: this amounts to saying that this form of perceiving is that which characterises the ego, as contrasted with the other, which is impersonal, and the same throughout the whole zoological scale. But from the fact that we perceive thus in two different manners it also results that we may call up the past by the same procedures, and according to the necessity of the moment we go through the whole film just as it was registered, or else we only look for one of its images. Here, consequently, is yet another point of similarity between the two phenomena of perception and conception.

However, the synthesis which operates in conception also differs from that which we have already examined: whereas with each new object that we *perceive* our mind is enriched by a new sensitive image (or the symbol of this image), the *conceptual* synthesis enriches the mind with a new relation between certain existing mnesic elements, and makes new products with old material. But we must be perfectly clear as to the meaning of "new image" and "new relation."

In the first case something new is added to our sources of knowledge. In the second case there is a new grouping of old elements following an ancient relation. Thus newness is quite distinct from *originality, which consists in a synthesis of ancient elements following on a new relation.*

The two psychic operations which, in fact, constitute intelligence and are both based on recollection may still

be compared in another manner. Perception shows us the mind as a system registering experience. Our sensory organs provide the general who conducts operations with an intelligence service. They act as scouts and spies and are the outposts placed for observation of the enemy.

Conception, on the contrary, represents the service which orders the manner of reaction against the enemy; with the aid of the indications obtained he calculates and combines, and examines the alternatives of retreat and attack. Conception creates.

Still, we have seen that in the two operations the mind makes use of the same mnemonic elements, of the same relations between these elements, of the same mechanisms of recall, and of the same affects, which give the impetus to all this memorial material. The final purpose of these two operations allows us to infer that it is the obscure tendency to adaptation which rules their functioning: perception sees to our security, conception prepares for the reaction which will remove or bring nearer either the subject or the object. These two different results seem to be consequences of the fact that the principal accent of the operations bears now on the outer world, now on the ego. In the former case the psychic current is directed from the periphery towards the interior—it is centripetal; in the second case the contrary movement takes place—it is centrifugal.

The author is quite aware of the circumstance that the terms "psychic current," "psychic energy," etc., like all hypotheses, explain nothing; the factor which they denominate is none the less an unknown *x*. Only, as has been said, they are images; tokens easily handled, providing convenient method of explaining our theories; they are simply propositions which help us to consider alternatives. The term "psychic energy" expresses its concrete nature as little as does "energy" when used in the physical sciences. The displacement of the psychic accent, when passing from one mental operation to the other, means that the affect awakened by outer excitation

is replaced by an affect which for its awakening is independent of the non-ego. The subject becomes cause in the place of the object.

We here touch upon a mystery which we shall not try to elucidate. We shall only call attention to it in passing; but we must remember that we have already found that this affect, the expression of the ego, colours the images of reality with a uniform tint which constitutes the mark of our personality. We were once led to call this the tendency to effect adaptation; we have also called it wish, and then will. It is that which Schopenhauer calls "universal will," Janet the "function of the real," and Bergson the *élan vital*, and which has presided over adaptation since the first appearance of life. This is why the animal, fundamentally, is occupied only with itself; and it is this that lies at the base of human egoism. Besides, the question of the continuity of the *élan vital* as exciting agent in perception and conception will receive further on all the attention it deserves.

* * * * *

In the course of the above discussion we have come to a conclusion which I lay some stress upon, because it will enable us to consider the problem of conception from a different aspect. We have found that "conceiving" in most cases is equal to "creating new things out of old," which process we have carefully distinguished from originality. This distinction, by its very nature, will lead us to the problem of invention, to which I shall devote the following pages.

To define and plainly mark the elements of discussion, let us be careful to agree as to the respective value, firstly, of the conceptual synthesis which results in a new grouping of ancient elements following an *ancient* relation (or relations), and secondly, of the synthesis that leads to an invention; that is, to a new grouping of ancient elements, following a *new* relation.

For the lay man to think, to conceive, consists especially in constantly reproducing the same words-symbols,

grouped in accordance with a certain number of syntheses, which hardly vary. I have read somewhere, if my memory does not betray me, that the vocabulary of the English peasant in certain parts of the country does not exceed more than 180 words. We may therefore imagine that the number of syntheses over which such folk dispose will be strictly limited, and that automatically, without their awareness, the same syntheses must continually recur in their thoughts. What is spontaneous and habitual, as, for instance, the incessant use of memory from birth till death, does not attract our attention, as I have already remarked. Only the abnormal strikes us, and the new. And when we are accustomed to the new, horrible even though it be (I am thinking of my war experiences), it no longer moves us; we notice it no longer. It is as though by repetition the mind acquires a tendency to admit that it must be so. An established synthesis possesses a power of its own, very noticeable when we consider its effects in a domain which at first sight might seem completely outside philosophy; in sociology, for instance. What we call *la force du précédent* in psychology is there translated by "the right of the first occupant," and in infantile sociology by the right acquired by the simple fact of having first seen an object. Thus a factor which undoubtedly plays a rôle in the unconscious, as it leads to the application of the same synthesis without surprising the mind, leads us in another domain to a principle which still dominates our actual legal right of property. It is in this sense that the following little observation acquires its proper value: A young girl is scolded by her mother because she uses face-powder. The child discovers a peremptory justification: "Oh, but I have done it ever so long!" Habit or use had in her eyes the value of a justification.

What we are not sufficiently aware of is that when we reproduce the same synthesis, when we reason in accordance with the same principle, we almost become automata. We trust to our reduplicative memory, which faithfully registers the order in which our syntheses are

formed, and, following the law of the least effort, we are tempted to use again and again the same procedure, which is far easier than to take the trouble of establishing new syntheses. We remark the tic of the man who constantly twirls his moustache, of the lady who picks at her dress with her hand, we smile inwardly when we observe that a friend constantly repeats : " Do you see," or " I never said it wasn't," but we do not notice that we do very nearly the same thing in always using the same syntheses. It is, however, only a question of more or less. Our own mental habits do not strike us ; we seldom remark those of the people living around us. But our unconscious knowledge of their usual syntheses leads us to guess their thoughts, to know beforehand what they are going to say.

It is still to his reduplicative memory, registering the usual syntheses, that the orator, who is not a brilliant improvisateur, trusts to assist him in the development of his subject, of which he has only memorised or written down the outlines. I will not insist longer on this lack of originality, due to the constant use of ancient and current syntheses. It has often been described : think of the " lines of least resistance " and " lines of discharge " of Spencer, etc. But we may remark that the education of children really amounts to teaching them the greatest possible number of syntheses between the intellectual elements confided to their memory ; or, in other words, to placing at their disposal the greatest possible number of psychic automatisms. But it will be permitted to recall here the old reproach, namely, that it kills all originality. Its task consists in teaching syntheses established and used by everybody, ready-made syntheses, to prevent the young brain from spontaneously establishing erroneous relations. But in making the task easy it is at the same time encouraging laziness, since it prevents the mind from operating of itself and for itself. But this is a lesser evil, resulting in a greater benefit ; the procedure allows the communication in a minimum of time of all the experience acquired by the species, and

on this basis the mind is then able to build up its own individuality. But in addition to the inevitable evil mentioned, there is yet another which education should endeavour to avoid: When the pupil feels mature enough to establish new, personal and sometimes original syntheses by himself, the teacher should not nip in the bud the unconscious process, which might flourish and prosper. Let him avoid the example of the master who wants the "original" compositions of the whole class to be identically the same, or the teacher of literature who scoffs at a boy who presumes to dislike a much-commended author whom he has read. The young brain has the right to synthetise in its own way, to reject the stereotyped expressions, provided he be sincere. But there is a negative side to the problem. To work constructively at the development of originality in the child one must provoke and encourage it by means of exercises of application in all branches of education. These permit the child to establish original syntheses between the different elements of knowledge—those very elements which the adult synthetises in his day-dreams—and furnish each mind with opportunities of manifesting itself in accordance with its individual gifts. A pupil naturally "cut out" for science, for instance, cannot exploit this ability to proper advantage if the opportunity is not offered to him in the course of this branch of the curriculum. Still, as everyone admits, youth is *par excellence*, the age of originality, as the pretty thought of a five-year-old child proves, who called the stars "little holes in the sky through which the angels look at us." We shall presently see to what this advantage of youth is to be attributed.

But since human thought consists principally in a system of psychic automatisms, how then is animal thought to be conceived? We may emphatically state that the first ideation which took place at the origin of life was a real invention, although it resulted only in a movement. And it was by successive inventions, thanks to animal originality, that the mind progressed. We

may readily imagine that the first conception, that of choosing between movement or inertia, or between two contractions, has been retained by reduplicative memory. If the intelligence of the same identical individual had to begin all over again the same primitive invention wherever the same circumstances arose, all progress would be excluded and psychic history would not exist The first invention being remembered, the primitive psyche no longer has to trouble about external circumstances which may be met by the simple awakening of memory, and by the fact it is free to solve a second problem, to say nothing of the fact that the first realised synthesis may serve as basis. By this reasoning, which we cannot pursue in these pages, I merely wish to indicate how the vital energy has presided over choice since the beginning.

Upon ascending the scale of beings we find that the number of sensory-motor syntheses at the disposal of the individual increases. (I will discuss in the next chapter how we may conceive the relation between these sensory-motor syntheses, muscular automatisms and purely intellectual syntheses.) But experiment, training and observation teach us that, whatever the degree of mental development of its species, an animal is always capable of realising new syntheses which it remembers. I have already given some examples, and the essays in zoological psychology are full of them.

We thus find ourselves in the presence of two spontaneous tendencies which seem to contradict each other. On the one hand, reduplicative memory retains the syntheses in their natural sequence, once they have been established, and we think to recognise the principle of the least effort in the reactions of the animal, which exploits it on every possible occasion. On the other side, the animal is always capable of making a new synthesis under the compulsion of circumstances. We conclude that the function of synthesis (perception, conception, synthetical memory) exists in the animal side by side with its automatism. We may imagine that the

circumstances which lead man to create new relations, to be original, do not differ from the incitements of the animal mind. The motives which provoke human activity, which sharpen the mind, can always be traced back to the non-ego, even though this does not appear to be the case at first sight. It is the same with the inferior animals: everywhere "necessity is the mother of invention." To make the mind relinquish its mental habits circumstances must impose themselves upon it.

But the automatic character of animal reactions, which has so clearly been proved by Hachet-Souplet and his colleagues, has another biological meaning which I would fain lay stress upon. The system of psychic automatism in man permits of a great variety, contrasting singularly with the fixity of animal reactions. It permits him to adapt his syntheses immediately to the ever-changing surroundings. These, on their part, exact from him an attention which never relaxes as long as the need of adaptation lasts. With animals, attention is of a disconcerting instability—as all trainers know only too well. It seems as though nature has sought to make up for this defect by giving the animal an automatism which not only acts without attention, but sometimes even notwithstanding an opposing wish.

In reality, the order of argument should be reversed; we ought to say that the motor automatism of the animal has at the other end of the series become a psychic automatism, which at the same time permits of a mobility such that it suffices, with few exceptions, to its continual adaptation to the conditions of its ever-varying environment. The will directing our usual mental syntheses is the psychological equivalent of animal automatism. I am here forced to interrupt the discussion, which will be resumed in the next chapter. However, I will first remark that when the normal human individual has recourse to animal automatism he places himself under the same conditions as the beast: his mind becomes free for new syntheses, whether they are original or not.

In fact, the number of sensory-motor automatisms

in man is much greater than in any animal, for he has consciously made use of this natural tendency to confide to it the performance, with a minimum of attention, of all his usual, commonplace motor-reactions. It is thanks to this artifice that a woman is able to read a novel while using her hands (as in knitting), that a manual labourer sings or thinks while working, etc. These automatisms are carried out even more excellently if conscious attention does not interfere, as we said before when mentioning stuttering, and we all know that if we are in doubt as to the spelling of a word we have but to write it down automatically to be immediately enlightened.

In the same way, it is difficult for a workman to show by the decomposition of his movements (that is, by applying his voluntary attention) how he executes an operation habitual in his kind of labour. He nearly always makes a wrong movement. At present, I have, I suppose, sufficiently established the fact that the synthesis realised in ordinary conception is but a repetition, a reassociation, of ancient elements following an ancient relation. We may now pass on to inquire into that mechanism of conception which makes us see things in a new light, which produces something original; in a word, the mechanism of scientific invention.

Faithful to the method which leads from the examination of facts to the conclusions which naturally follow, I here reproduce a few examples selected from among my observations. Still, they offer one great disadvantage; it is that they might expose me to unfavourable criticism, which would see in them indications of vanity, since by the fact of employing them I place myself in the ranks of the inventors. To talk about oneself always had serious disadvantages. The reader will, however, immediately remark that the following observations are merely scattered thoughts which do not constitute inventions in the vulgar sense of the word, but sometimes possess enough originality of character to enable them to serve as the basis of a first attempt

at the solution of a problem which has occupied searchers since philosophy became a science.

He who conceived them—unconsciously, in the full acceptation of the word—sees no reason for vanity in them, and has even had to make a sacrifice of his *amour-propre* in overcoming his reluctance frankly to disclose his mode of thinking to the reader.

However, it is quite possible that the two ideas which I believe to be original, and which will here be subjected to analysis, are not so in reality, but have already been conceived by others. But this is of little importance, for they were new to me when they occurred, and this peculiarity is sufficient to make them of use in this connection. After this apologetic preliminary let us come to the facts.

One night I had been in bed for a quarter of an hour, trying to get some sleep, when an idea occurred to me which I accepted with that feeling of *Eurêka* so well known to all seekers. Since I had closed my eyes, trying to feel no interest in anything and to obtain an absolutely blank mind, a great number of other ideas had already spontaneously been formed, but my conscious ego had paid them no attention. On the contrary, my mind made efforts to detach itself; it warded them off, it tried to keep them away, for, as Claparède [1] said, "without disinterest for the present situation" sleep is not possible. In the presence of this thought, however, it changed its attitude. With a feeling of great satisfaction it welcomed it into consciousness, gave it a lively attention, and I awoke almost entirely, but without opening my eyes.

The idea in question presented itself in this concise form: "*Perception includes an unconscious judgment as well as Conception.*" Following an old habit, inspired by the wish never to lose an idea which may be of use in the research I am undertaking, I immediately scribble it down on a scrap of paper. But as the psychology

[1] Cf. E. Claparède, *Esquisse d'une théorie biologique du sommeil*, Archives de Psychologie, t. iv. 1909.

of inspiration is a problem whose solution I have pursued for years, and as I believe I have before me a case which deserves to be thoroughly observed, I turn on the light, to retrace at my ease the different phases of the ideation, as though it were a phantasy. I thus succeed in recalling successively all the fore-conscious phenomena which preceded the conclusion which has now found its way into consciousness: In the course of the afternoon I was correcting part of the proofs of my *Psychology of Day-dreams*. In this work there is a passage which much resembles the analysis of the flea-fancy, but undertaken from the point of view of visualisation in the fore-conscious state. Upon reviving the recollection of this analysis, but without being aware of it, I had a vision which I would describe as follows: The *leit-motiv*, which returns at each new phase of the old phantasy " How am I to get rid of the flea ? " had now vaguely taken the form of a straight magnet hanging above a surface comparable to that of the sea, but vaguely perceived. This sea represents memory. From time to time it is as though a fish came up out of it and leaped towards the magnet, and then fell back. This was a way of representing concretely and without will the recollections which are successively awakened as trial solutions. (I am now aware that the source of this hallucination, much fainter than in a dream and whose outlines became definite only on analysis, must be looked for in Jastrow's book, *The Subconscious*, where the metaphor of the mind fishing for recollections in the sea of memory is effectively used.) After this first fore-conscious vision my mind picked up this same phantasmagoria again, but this time it was the electric spark, representing the question: " What object could have produced it ? " (arc-lamp, etc., cf. observation p. 56), and no longer a magnet, which attracted the recollections, made them leap upwards, and let them fall back again. This double animated picture made me conclude, in words, that " the recollections revived in perception are not more arbitrarily awakened than in conception. There is in both cases the same discrimina-

tion in the unconscious awakening." Then came the final conclusion which caused my awakening: "Perception includes an unconscious judgment as well as Conception."

I am well aware that such a penetrating analysis as the following necessitates close attention on the part of the reader, if he would follow it in all its details. The truth demands that I should further add that (1) I had never before thought of comparing the mechanism of perception with that of conception from this special point of view (the scheme on page 124 is the direct result of this), and (2) by "unconscious judgment" I mean the act of discrimination, which leads to the sole awakening of a recollection which might be of use in the solution of this problem, and which leaves all the rest in the background. At this moment I had discovered the method of testing every recollection which also includes an unconscious judgment, and which I have described in the foregoing pages. What I want to lay stress upon here is the fact that the starting-point of all this ideation is the analysis of the mechanism of conception which I had undertaken in my previous book. At that time the idea had not yet occurred to me to apply it to perception. This mechanism was visualised during the course of the inspiration which we are examining as a marine landscape. (Here is a novelty to begin with.) Also, I had already observed the case of the electric spark, showing that sensation revives recollections which are not indifferent. But the fact of transforming this knowledge into an image similar to the first (sea, fish, etc.), had not yet occurred to my mind. The final conclusion which summarises the whole phenomenon is evidently new also, at least to me.

If we now try to sum up the different stages of the synthesis thus fore-consciously elaborated, we distinguish the following:—

(1) A complex recollection known in all its details (the stages of conception) is represented concretely in moving pictures.

(2) The mind tries to determine whether these images might not also serve to represent a recollection of which all the details have not yet been so well apprehended (the known phases of perception), namely, the recall of remembrances.

(3) The mind remarks that the comparison holds good and forms the conculsion that the yet unknown phases of perception are identical with those of conception; in other terms, the recall of mnesic images is not arbitrary but is the *result of an unconscious discrimination*, as in the first case.

We now detach ourselves from this analysis and wonder what the originality may consist in, if it be granted that there is any originality. The answer is as follows: it is original to consider perception as a conception. The subsequent conscious reasoning shows that the difference between the two phenomena resides in a displacement of the psychic accent, as I have explained before.

In the last analysis the originality consists in making an unexpected synthesis connecting the two mental constructions under consideration: a relation which had not yet been thought of, as far as I know.

The observation which we have analysed here only occupied about seven lines in my notebook. That is to say, at the moment of writing it down I was satisfied by marking the different stages so as to be able to reconstitute them at a subsequent opportunity, such as occurred to-day. Further, once it was written down, I thought no more of the matter. What follows necessitates a parenthesis to communicate a few indispensable details as to my mode of working. Empirically I have evolved a procedure which strikes me to-day as offering a close resemblance to what I imagine to be the way of thinking followed by animals, whose ideation is very fitful and is busy with many subjects in a comparatively short time.

I namely repeat that I have formed the habit of marking down all ideas likely to be useful in my research work. But it so happens that my notes are a disordered mixture, which enables me later to observe that it is now the

problem of unconscious movements that has occupied me, now that of instinct, or of inspiration, and so on There is no appearance of order or method. It is a real flotsam and jetsam, which forces me to make a minute and careful catalogue of my thoughts so as to find the threads which unite them. Is it not an unavailable proof that our intelligence, like the animal mind if left to itself in the fore-conscious state, continually jumps from one subject to another, although remaining within the limits of our field of investigation ? But I never catalogue any ideas except when I consider that my period of incubation is at an end, and then I make up my mind to write. It so happens that I had completely forgotten what I was thinking of at the beginning of my undertaking, for there are preparatory stages that last for years. But I then invariably find that without knowing it I have had the same idea returning in slightly different forms. These are the reminiscences to which I have alluded before. Each unconscious repetition of a find already effected is accompanied by the same inner satisfaction as at first ; indeed, the mind is not aware of the repetition. And, though this repeated exultation is not justified, it is not astonishing, considering that all our ideas result from distraction ; welcomed, it is true, but distractions all the same. They are all the products of my fore-conscious and not the result of a voluntary and directed reflection. It is thus that the synthesis which we have analysed above recurs twice in my notes, at different times, without my having noticed it.[1]

We will now proceed to the examination of another

[1] I think this reminiscence, accepted by the mind with the same amount of joy as an original invention, is due to the fact that its conscious integration has not been sufficiently completed. If I had made a careful analysis, as above, the same idea would not have returned twice as one unknown on the threshold of my consciousness. I should have recognised it at once. I offer this remark because it permits the comparison of the normal fact described with the morbid phenomenon. From existing literature, it is evident that in neurosis the same thought can again and again invade the consciousness without being recognised. I am satisfied with pointing out this similarity and pass on without further comment, but we shall return to it later.

synthesis, new to him who conceived it, and perhaps original. This analysis will be effected more easily. The idea occurred exactly thirty-two days before the former. One morning I was on the way to my usual occupation, when I suddenly stopped, struck by a resurgent idea. The note which I instantly made is literally this: "Perception and Conception are the same phenomenon, but in the first case memory is set moving by an external excitation, whereas in the second the excitation is internal."

A few hours later I had occasion to reconstitute the subliminal process which had led to this conclusion. Six months earlier I had had the intuitive impression that there must be a close analogy between these two phenomena, and in my divagations this problem often returned. This is what happened before I had been able to register the above inspiration.

I am walking in the street absent-mindedly, but as I have the habit of introspection I suddenly find that I am forging a concatenation depending from a horse at which I have just glanced, but without special attention. Upon remarking this fact I continue my thoughts, completely unaware of them: "It is thus that the external excitation which sets my memory moving (my inner self knows very well what it means by "sets my memory moving," for behind it lurks the recollection of my definition of the act of thinking: the adaptation to a present situation of recollections revived under the influence of an affect or of will); at the same moment I have also a visual impression: the image of an arrow penetrating the eye, and simultaneously, moving in the opposite direction, some words classed in groups, which are separated by a short interval (revived recollections) and lined up as though they were attached by an invisible thread which draws them towards the arrow.[1]

[1] I had not then made the observation of the electric spark, the mechanism of which I later represented as follows: to an obliquely stretched rope are attached, at short distances, reductions to the scale of about two inches of an arc lamp, a tramcar, a train of the overhead electric and a lift, images which are successively revived. It is thus that my mind involuntarily concretises the mechanism of perception.

Following this visualisation my second ego reasons: Perception is a sensorial phenomenon producing (or releasing) an automatic flow of memorial elements. Conception equally causes an automatic flow of certain mnesic elements. But whereas in the first case the unlatching of the door of memory is caused by a sensation, in the second it is due to a wish. (I have at this moment the vision of recollections lined up in the same way as before, but *pushed* forward by an invisible force instead of being *drawn out*). And the conclusion follows: the unlatching is caused by an outside agent, it is no longer internal. There is the analogy and at the same time the difference. The final conclusion, that which draws the conscious attention, needed to make it cross the threshold, is given above.

This conception may be reduced to:

(1) An auto-observation, equivalent to a fore-conscious perception (an outer excitation has set my memory on the move), sustained by a moving image which underlies the ideal direction of the psychic current in perception in general.

(2) A visualised recollection of my definition of conception to which the foregoing movement is applied and tested.

(3) Conclusion: The analogy and the difference which the visualisation shows are translated in words: Perception and conception are the same phenomenon, but the starting-point differs.

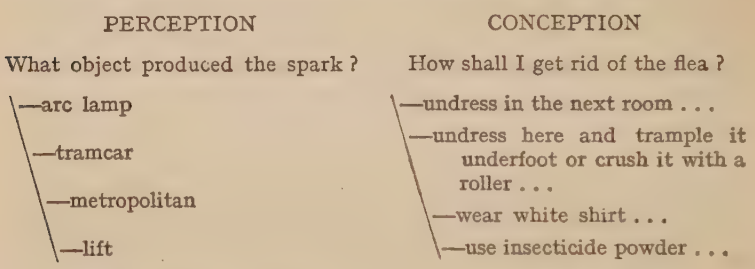
We might call the mechanism, as it is summarised above, an original fore-conscious comparison, because perception is again treated as a conception, and inversely.

I must now emphasise what the originality of the two conceptions just analysed consists in, and I think the best method to adopt is that of the animal which

Imagination successively applies each image of an object to the indeterminate spot which represents the sensation, as though to convince itself that sensation and recollection match. These fore-conscious processes may seem rather ridiculous. But who would say that they are without any value to science? As for myself, they undoubtedly facilitate my abstract thinking.

always proceeds spontaneously from the known to the unknown. Let us thus establish a parallel between the synthesis previously analysed (the day-dream of the flea) and what I take to be original ideas.

If we go back to the schematic representation on page 124 we find, at first sight, that there is a fundamental difference between these syntheses and those given there. It would be impossible to represent them both in the same manner. For the convenience of the reader, we will therefore reproduce our old scheme.


PERCEPTION
What object produced the spark ?
—arc lamp
—tramcar
—metropolitan
—lift
CONCEPTION
How shall I get rid of the flea ?
—undress in the next room . . .
—undress here and trample it underfoot or crush it with a roller . . .
—wear white shirt . . .
—use insecticide powder . . .

In these mental operations an object or a means had to be found, but one taking into account a known relation. This known and pre-existent relation, which unites in the same synthesis all the elements that are successively revived in the act of perception but which is not translated into words, may be expressed as follows: *These are all objects capable of producing an electric spark.* Similarly, in the parallel conception a known relation unites the mnesic elements: *All are elements which may lead to the destruction of the flea* (although some may be preposterous).

In my little inventions the mind equally proceeds to comparisons of recollections more or less known, but without previous awareness of the exact meaning of the relations which might exist between them, at least from the special point of view considered. There was a foreboding, a faint intuition of their resemblance, of the relation which classifies them in the same category, but the details still had to appear clearly. In a word, in my two last observations, my mind ends *by establishing a relation which did not exist before.*

We find that we are here in the presence of a third form of synthesis which we have not studied hitherto, namely, that which enriches our synthetical memory with a new relation between ancient elements. Still, we have already found, in the foregoing chapters, a few instances of this mental activity, namely, in the case of Mr. Dugas, who after many years assimilated the name of Van Eyck, preserved by his reduplicative memory (cf. p. 69), and the one relating how I noticed for the first time the analogy between an infantile procedure and a process characteristic of unconscious ideation (pp. 70–71). There is, however, a difference between the two cases which I wish to point out. I do not believe that Mr. Dugas claims originality for the instance which he communicates, for the relation which he establishes between a line of caligraphy from his childhood and the words of the lecture to which he is listening is not new to other people, whereas the parallelism effected in my day-dream was new, not only to me, but also, I think, to the world: it was original.

Therefore I believe that the originality of invention has always as its point of departure the discovery of a new resemblance between some elements of memory.[1] The inventor, in the common sense of the word, does not begin to look for new material which will make him famous before he has first hit upon a fortunate original synthesis.

We may now pursue our comparison between the two procedures of synthesis previously examined and that which I have just analysed by the remark that the psychic mechanism, which serves as the basis of all three, is still constituted by the tendency to discover the similar in what appears at first sight to be different.

In each of the three phenomena—Perception, Conception, Invention—the mind starts from a supposition, supported by an intuitive impression of similarity: in the two first cases it presupposes that each image, each

[1] It would not be difficult to prove that all reasoned discoveries (conscious or unconscious) have the same starting-point.

complex successively evoked, will be adapted to the external conditions; in the last case it expects that the second image will reveal common traits. This search for the similar is especially obvious in the riddles based on a new and unexpected relation established between two objects of perception.[1] The inventive faculty is sharpened by this game. It provides a practice for the unconscious tendency to discover unsuspected similitudes, to consider things from a new angle.

If instead of instantaneous perception we consider postponed identification, we may say that all three operations are performed in the absence of the real objects, consequently—thanks to memory, which retains the relations between the images as well as the images themselves (unless it be admitted that the recollections of synthetical relations equally constitute mnemonic images)—then we might conclude that the mind always operates with mnemonic images, which amounts to saying *that memory is the basis of intelligence. It is with its elements that the wish operates.*

Invention is, like Perception and Conception, an empirical process. This conclusion calls for some comment, for it might seem to contradict the opinion of many psychologists who have examined the problem of invention. Indeed, who says empiric says experience, and the word "inspiration" commonly applied to the particular process of synthesis which we are examining here sufficiently reveals how fore-conscious invention has always been considered independent of experience. But I have good reasons for sustaining my point of view. I wrote above that "six months ago I had the intuition that there must be a close analogy between these two phenomena," and that "in abstracted moods this problem often recurred." During this period my mind was making attempts which I did not observe sufficiently well. I regret now that I cannot place before the reader's eyes any of these day-dreams, which constituted unsuccessful

[1] Cf. Why is a wedding-ring like eternity? Because it has no beginning and no end.

attempts undertaken by my second self to find a solution of my problem. I will explain how this gap in my series of observations was produced. In the course of the year, which was occupied in the preparation of this essay, at least, of its essential parts (for many details date back from a much earlier period), I made a note only of such fore-conscious ideations as seemed *directly* to bring me nearer to my goal. I did not then imagine that one day the necessity would arise for the reproduction of a day-dream, whose contents were not an immediate contribution to my theory, but which would be used as a convincing proof.

At any rate, during the war, in my free moments, I undertook research-work touching day-dreams in general, and I then happened to register phantasies which I then called "inspirations that proved abortive." [1]

[1] Here is an observation made on September 30, 1917. While reading REGIS and HESNARD'S *La Psychoanalyse*, I became absent-minded for a few minutes, and then went on reading at the top of page 61, to stop again after a few moments with the remark: "Great Scot! Here is an inspiration that proved abortive!" I thus gave expression to an intuition which had come to me, informing me at the same time that an association of fore-conscious ideas had taken place, that it was of an intellectual nature, but that it had not led to an inspiration, though it might be useful later on as an observation. I immediately laid down my book and retraced the following day-dream:

I will first remind the reader that it was the expression "very vague classical term," on the last line of page 60 of the book, which had given my mind occasion to wander. I use the classical term "meditation" and "reflection" myself. I even establish such subtle distinctions that the reader may have some difficulty in following me, for which I might be censured. But is it worth while to give a long explanation? Or shall I write down the difference between these concepts merely in a small paragraph of two or three lines? Besides, how does one translate *meditation* and *reflection* exactly, in English? If I do not find the word immediately I shall leave a blank and fill it in later. At any rate, I shall want a good dictionary. It is important that the difference should be noted, for I want to write my book in English, etc. . . . But I am straying! (Here the reading was resumed.)

This observation would be more convincing if it were directly connected with the process of synthesis, but it will nevertheless suffice to establish the fact that our mind may be active without leading to an invention and without the knowledge of the conscious ego. If, in spite of the insignificant character of this concatenation, I have succeeded in becoming aware of it and registering it, this is because I have long

I conclude, without hesitation, that the combination from which the invention results, characterized as is the latter by "brevity, suddenness and immediate certitude," is preceded in the fore-conscious by a number of unfruitful scaffoldings defying all estimation, because our conscious ego is never warned of them.

It is for this reason that I call invention an empirical process. The successive tests, which in ordinary conception and perception take place one immediately after the other and are easily observable for this reason, are in invention spread over an indeterminate period of time. It is thus to be understood how Newton, in his own words, only discovered the theory of universal attraction *by always thinking about it*, and that Henri Poincaré only the relation between the transformations of non-euclidian geometry and that of the indefinite ternary and the quadratic forms of arithmetic long after he had suspected it.[1]

The comparative slowness with which originality is reached is explained by the fact that it has no existing psychic path at its disposal. The two streams which flow together must not only seek to meet by leaving their old beds, but their confluence must satisfy certain conditions established beforehand and dictated by the principle of similitude.

The comparison between our three methods of synthesis now leads me to say a few words of the rôle of unconscious judgment in each of them. In Perception and Conception this judgment is manifested on two different occasions: firstly, on the awakening of each of the recollections. As the latter are not indifferent, as there is discrimination, this can only result from a mental operation of which we have not the slightest knowledge. Secondly, these recollections are successively

practised introspection and also because I had at that time decided to observe all subliminal ideations which I might stumble upon, whatever their contents. Anyone who will take the same trouble will be able to become conscious of his subliminal ideation.

[1] Cf. H. POINCARÉ, *Science et Hypothèse*, p. 24.

subjected to a test (we have seen that at this moment reduplicative memory intervenes), and normally the partial result of these attempts does not cross the threshold unless it satisfies the conditions which the mind has established beforehand. Sometimes, when the result is negative, we experience a feeling of annoyance or regret on not finding it.

In invention, too, memory is useful, for it is thanks to it that we are able to recall the elements between which a new synthesis has to be established. The same power of discrimination, which in the first cases revives the recollection *ad hoc*, is active here. The act of comparison between the two elements is further followed up by a negative or positive judgment: the former results in the abandoning of the unsuccessful attempt without our becoming aware of anything whatever; sometimes, though, with a faint impression of annoyance to which we pay no attention, but which may become manifested as nervousness, excitability, etc. The positive decision is nearly always announced by a sentiment of exultation followed by the rise of the combination into the conscious field. This feeling of certitude, of joy at finding, is also present in intuition. But it has at no time recourse to reduplicative memory, for the simple reason that for it there exists no term of comparison: as what we have thought is new. The intimate impression of certainty which we feel is indeed sufficient to convince us that what we have discovered is the truth; we have no doubt as in other cases; we do not feel the need of a mental test. However, the subsequent conscious development of inspiration constitutes for the mind, at last master of itself, the final test, preceding the conscious and final integration.

At the risk of being taken for one who imagines himself to possess a spark of genius, because of the two poor little original ideas analysed above (for an unkind critic might claim that I rank myself with genius), I cannot without protest pass by such theories as this: "Intuition, the creative genius, largely goes beyond the limit of the

intellectual faculties. *There is in intuition, in genius, nothing of that which characterises the concatenations of logic.* They are superior faculties *evidently belonging to the divine essence of the ego.*[1]

I wonder whether the word genius might not chance to be one of these pompous words behind which man tries to shield his ignorance? Evidently there are different degrees of intelligence. But if in this quotation we neglect the word genius, which for me simply represents a superior degree of intelligence, who would maintain that in my "intuition,"[2] logic is not observed, and, on the other hand, that it contains anything "divine"? But if I set others on their guard against exaggeration I must follow this advice myself by declaring that I do not consider the problem of originality solved by the observations above communicated. I have, moreover, declared that this is but a sketch of a solution. Still, it permits us to grasp the fact that we must get used to seeing nothing supra-normal in the phenomenon of intuition. This is, besides, a point to which I shall return in order to defend quite an opposite thesis: namely, that of invention as a process of synthesis common to man and animal. I therefore close the discussion here with the remark that the characters of brevity and suddenness attributed to invention depend especially on our ignorance of our own psychic processes.

I feel convinced that originality resides merely in a question of more or less, for we are all original in different degrees. After all, to be original according to the definition of the word, it is enough to be the origin of a new relation between old elements, to make a synthesis

[1] Cf. G. GELEY, *De l'Inconscient au Conscient*, p. 228, Alcan, Paris. 1920.

[2] I do not agree as to the ordinary meaning given to the word. In my *Psychology of Day-dreams* I have given the reasons for which I should prefer to reserve the word "intuition" to designate the fore-conscious affect which announces the intellectual element that attracts our conscious attention to what happens across the threshold, that warns us when we have found something new or when we do not succeed in reviving something which refuses to return.

that has not yet been made, modest as it may be. I will ask the reader's permission to illustrate this theory by a couple of instances :—

(1) The other day, while reading the booklet *Zur Psycho-analyse der Kriegsneurosen*, I read the sentence "*das Interesse . . . raümte andere Sorgen den Platz.*" Immediately the expression "*den Platz raümen*" revived the remembrance of the corresponding Dutch expression in a verse of Tollens : "De veldvreugde *ruimde* voor d'ÿsvreugd *de plaats.*" I had thus established a new relation, a real synthesis, at least new to me.

(2) During the war, the promptitude with which I succeeded in seizing all occasions of observing fore-conscious phenomena in myself and others had for me become the object of much reflection. I was astonished by my ability, which gradually increased, of becoming aware of my fore-conscious movements and ideations, my observation-wish being always ready, wherever I was. I had already compared it with the predisposition, proper to those who suffer from some congenital disability, to re-animate the recollection of their infirmity and to place it in relation with innocently uttered words, which their second self interprets as insults. One day I was struck by the fact that the farmers of the north of France had not adopted the summer hour, all their clocks being sixty minutes late. Thereupon my second self concluded in the course of a phantasy : "each time they come into contact with the army they have to make a fore-conscious reduction ; they must always keep the recollection of this hour ready on the threshold of consciousness, as I do with the recollection that I must practise introspection."

It will be agreed that in both cases the simile was unexpected, and in the latter it was certainly original. Neither of the two syntheses, however, was of any value to other people, for it is there, we believe, that we must seek the criterion of originality in the common sense of the word. It is not sufficient that a synthesis should be original to bring about, on the part of one's equals,

a certain amount of consideration. It is especially for its practical value that it is appreciated. In fine, we all have in us the necessary elements of originality; we are all frequently original, but the new syntheses which we realise have a value for the individual only.

But while we have succeeded in reducing the ordinary perceptual and conceptual synthesis to a manifestation of the tendency of the mind to search the cause and to react against this cause, the analysis of the synthesis resulting in an invention has just now enabled us to recognise at the bottom of this mental operation a search for an analogy. Since then we are confronted by the question: What importance is to be attributed to this unconscious tendency, and what relation may it have with the other two? I am here tempted to admit, at least for as much as we have been able to discover, that invention seeks only to establish relations of resemblance or of dissemblance and not causal relations between mnemonic elements. Invention does not seem to worry as to what happens outside the ego. This may be the reason why it has nowhere, in the scale of beings, passed beyond the fore-conscious state; not even in man. In fact, he cannot invent when it pleases him, though he perceives the outside world and thinks when he judges it to be necessary. The function which we are examining here does not aim directly at obtaining knowledge of the surroundings, or at exerting an action against it. It is as though it was bent only upon devising a means of which Perception and Conception would make use later on.

Perhaps we may again find the solution of this problem by questioning the past, by considering what the mental reactions must have been in the beginning and what they still are in the animal.

Hachet-Souplet has established experimentally that the animal in training has a "tendency to attach the chain of his sensations to psychological antecedents of greater and greater antiquity," and I have tried to show that a similar tendency, corresponding with the search

for the cause, is met throughout the living world. In my opinion, it is to this tendency to discover the cause by observing more and more remote antecedents that the tendency to invention must be attached; a theory which amounts to this: Given a creature which usually experiences a given effect R of vital interest to it, A, B, C, D, E, F, the external phenomena which succeed each other and terminate the effect R. Following the reasoning exposed above (p. 41) the animal first learns to observe that F invariably precedes the experienced effect, then E, then D, and so on, always advancing a link. But if C is the real cause provoking its fore-conscious attention (I mean an attention of which it is not aware), it will not recognise it as such if it has not recognised a similar causal image before. In the same way, the illiterate does not attribute the causation of lightning to the electricity of the atmosphere because he has no ideas about electricity as a cause of light.

But if one day the animal mentioned above undergoes the effects of an event similar to the first, in which the cause C is replaced by a cause C′, which resembles it, it will, without knowing it, make the comparison between C and C′; it will perceive the analogy. It will at the same time have invented something and discovered something, for it will have established between C and C′ a relation which will allow it to discover that they are the causes of the effects it has undergone.

If we pass from theory to practice: To detect, with the aid of zoological psychology, a case of animal invention which excludes all doubt, it must be admitted that the thing is very difficult because of the impossibility of determining the exact contents of any animal's memory. Still, I do not consider myself defeated, and I will try to prove my theory with the aid of zoological psychology, but by pursuing an indirect course. It is the experimentalist who will furnish my arguments.

Modern training is a method which imitates nature in the sense that it makes use of the spontaneous tendencies of the animal towards ends strange to the mind

of the individual to be educated. Let us first examine how Hachet-Souplet teaches a dog to fetch and bring back something thrown to him: "Before the first lesson, let your dog fast a little. Then let him smell a little bag in which you will have put a bone still covered with some meat. Throw the bag down at a short distance. The dog will not fail to pounce upon it and take it in his mouth. At the moment when he has the bag between his teeth and lifts his head to take it away, go to him quickly and offer him a biscuit, *or any other sweetmeat.* He will drop the bag. Begin this all over again . . . you will finally get him to bring the bag back to you and drop it at your feet." [1]

From that moment the bag will appear to the dog an object capable of procuring him a sweetmeat. In his mind the bag will become cause.

You will gradually be able to substitute different objects for the bag, as long as the gift of the sweetmeat still remains associated with the act of bringing back. In other terms, all the objects brought back become for the dog objects susceptible of procuring him a sweetmeat when the master is present.

These different objects represent the C, C′, C″, etc., in the series above. The dog spontaneously establishes a relation of analogy between them: they are causative.

Later the sweetmeat becomes needless as an exciting agent. From the moment the automatism is established the dog cannot help bringing back certain objects, but there is a second mechanism which hardly profits the present discussion. Moreover, we shall examine it later on. The important point, for the moment, is that for the dog the different objects which he brings back are as many causes, which have for effects the enjoyment of sweetmeats.

Here I meet the objection that the dog, being an intelligent animal, is too clever to consider inanimate objects as causative. My hypothesis, however, is not at all inadmissible if we remember the mentality of the

[1] Cf. P. Hachet-Souplet, *Les Animaux savants*, p. 103, *op. cit.*

child who punishes a chair or a table for having caused him pain.

I think we may conclude that the animal, as well as man, possesses the faculty of discovering new analogies between different objects ; that is, it, too, possesses the power of inventing. But man as inventor is comparatively independent of external circumstances (the sole condition being that he should be able to detach himself from them), whereas the beast, on the contrary, being far more strongly attached to the past than we, only leaves beaten paths, only makes a new effort, under the stress of external conditions : necessity is the mother of invention. In the animal world originality depends on the variation of the surroundings. With man the creating affect, wish, has freed itself therefrom.

But if it also follows from this discussion that the phenomenon which is called invention in man is no other than what we call assimilation in animal. This analogy is easily to be traced back to education, which for man constitutes an inestimable economy, because it teaches him all known syntheses between the different objects he is required to apprehend. It spares him the trouble of inventing anew all that the race has invented before him. I will perhaps try to establish, in an ulterior study, that instinct, which is here merely hereditary memory, leads to the same end, but with the disadvantage that the latter has at the same time resulted in disinterest for the outside world, with the absence of consciousness as result. On the contrary, the animal whose instincts are few, so far as its parents do not provide for it, has to re-invent these syntheses.

Learning relations is, as I have pointed out before, the biological meaning of play ; and to a certain extent it still fills up with child the shortcomings of education.

I conclude by saying that synthesis, in establishing analogies between objects which were previously dissimilar, is not only invention itself, it is also the genesis of Perception (and therefore of Conception), for it is the necessary and sufficient condition for it. With no

remembrance of the relations of similitude the phenomenon of Perception could not occur any more than that of Conception. The anterior developments will have sufficed to establish this. On the other side, the same form of synthesis, namely, in Invention, operates with elements resulting from Perception and Conception, so that the conclusion follows that no one of these three psychic operations can dispense with the others. They jointly constitute the essential mechanisms of intelligence.

* * * * *

The last part of this chapter will be devoted to a short comparative study of the mechanism of synthesis in invention, in dreams and in day-dreams, preliminary to an examination under a new aspect of the hypothesis that originality is not a manifestation of the divine in man, but, on the contrary, what there is in us of the animal.

I will begin by reminding the reader of a characteristic of the two original syntheses which we have analysed above, but on which I laid no stress because the time had not come to make use of it : namely, the fact that in each case the ideation is accompanied by the revival of fore-conscious visual images, of mental pictures, not amorphous and lifeless, but, on the contrary, quite definite and animated.

I may even go further and give utterance to the conviction that the comparisons which my mind has succeeded in establishing in the absence of my conscious self owe their happy conclusion precisely to the fact that my intelligence has succeeded in finding a concrete means of representing the phenomena to be placed in parallel.

The result which has been reached is nothing but the rendering in words of the operations which my mental eye has followed. But, according to my experience, the individual who renounces the conscious state gives up at the same moment the power of pure abstraction, of thought by word-symbols, and little by little sinks into the unconscious state (of which the fore-conscious is by convention the first stage). At the same time his idea-

tion proceeds more and more with the aid of images. Better still: in the above instances of invention only the virtual images were endowed with movement; but at a more advanced stage of unconsciousness things still change their aspect.

In the flea-fancy I have not only the illusion of seeing the insect as a real object, of seeing curious details such as the interstices between the flag-stones where the insect might be hidden, but I even see myself moving and in full activity; I looked at myself undressing seeking to crush the flea underfoot, and pushing the garden roller, etc. We have, besides, the same hallucinations in dreams, only they are more vivid; whence I draw the conclusion that at the unconscious state thought is inseparable from image and movement. Provisionally I am content with laying stress upon this twofold analogy: (1) that we cannot imagine animal thought otherwise than with the aid of mnemonic images of objects; and (2) that animal thought seems inseparable from movement. It appears that it only reacts as does the cyclist, who, on the point of being caught between two oncoming carts approaching from opposite directions, drops down and has the presence of mind to push the bicycle off with one foot to prevent its being damaged by the nearest horse. With him, also, thinking and acting are one. If a movement comparable to that was executed by an animal in similar circumstances, we should have some difficulty in supposing that it was the result of a conception, and we should be tempted to attribute it to a reflex.

However it may be, we recognise in invention (involuntary at the moment it is produced), in day-dreams and in night dreams, a first indisputable element (the image) common with the mental reactions in animal. We may, besides, stretch this comparison and include the conscious perception of objects, which is likewise made with the aid of images, as I have already shown.

The second common element, movement, may appear more disputable, because a term is wanting in our com-

parison. For if we can admit that animals can only think with the aid of images, we are less familiarised with the idea that these images are gifted with movement when its mind evokes them. Still, we shall see in the next chapter that if Ribot is right in his conception that "all idea is a movement which commences," this must be so when we descend the zoological scale, as it is only in man that the psychic reactions are definitely freed from the system of mobility, but partially and relatively only.

We also understand more clearly at present this other conclusion of the same author's: "In short, creative imagination consists in the property of *images* to assemble in new combinations owing to the effect of a spontaneity of which we have tried to determine the nature. . . ." [1] In fact, we have seen, even on the occasion of psychic manifestations which may be regarded as cases reminding one of scientific invention, "*images* assembling in new combinations." And whereas artists agree that all art proceeds from images, we underline in passing the fact that visualisation is one of the elements which give rise to the suspicion that artistic inspiration in the main differs only from scientific invention in its methods of expression.

On the other hand, I may be permitted to recall that in artistic inspiration the mobility of memorial images acquires a great importance, and I may here mention the fact that L. Areat unites "under the title of professional memory, . . . the two visual and motor-memories of the painter." [2]

But after having emphasised the primitive character of scientific invention, we must also consider the other side. In contradistinction with our previous point of view we might indeed reason as follows: As thinking by images seems characteristic of the unconscious state, it is rather astonishing that, after having given up consciousness, man could still think in words which, in his foreconscious, seem to preserve their conventional meaning.

[1] Cf. Th. Ribot, *Essai sur l'Imagination créatrice*, p. 275, *op. cit.*
[2] Cf. L. Areat, *Psychologie du Peintre*, p. 57, Alcan, Paris. 1892.

As a matter of fact, circumstances prove that when in distraction man renounces the outside world to enter into his thoughts and pass into the fore-conscious state this renunciation does not involve the complete loss of all those faculties which are characteristic of consciousness. Some of these are carried over into this second state. It is thus in cases of inspiration, as in day-dreaming. In the three cases the words keep a certain meaning and may serve as elements of thought.

We would willingly talk of the collaboration between conscious and unconscious faculties. However, between these three cases very clear differences may be distinguished. In the course of inspiration, the words led by the mind into fore-consciousness keep their proper meaning, lent to them by the conscious self at the moment of the genesis of the distraction. Besides, the aim which the conscious ego has in view is not lost sight of for a single moment; it is as if will prolonged itself under the threshold to conduct the ideation to a good end without awareness. Better still, logic, as established in the conscious state, is strictly maintained; no queer suggestion appears; in other words, the usual synthetical relations which unite the various evoked mnesic complexes are preserved intact. In fact, the only change that seems to have been effected in the thinker's state is that he has no longer any notion of reality; he is not on the alert for external excitations. Not will, but another powerful factor of his psyche, has undertaken the direction of his mental apparatus; it is the strong wish to succeed in putting into words the solution so long felt but left unexpressed.

If we at present compare our conception of the recall of synthetised recollections, in the mental attitude which I have just described, with the states of protopathic and epicritic sensibility mentioned by Head and Riddoch, we shall perhaps be able to throw a little light on the mental operation pursued beneath the threshold of consciousness.

We have been brought to admit that when we recall

any remembrance the entire experience, as it was registered, has a tendency to come to light again, so that the act of recall would comprise a double operation: a mental current flowing along the shortest psychic path (established by synthesis) toward the desired image, while another part of the psychic energy would remain in the latent state: namely, that portion of experience which is useless for our present purpose. Such is the twofold operation which is performed in the act of recall, but just as in all other psychic processes the conscious ego becomes aware only of the end result. In other terms, the mind continually represses the primitive mechanisms, among which is that of original visualisation, and so loses part of its total energy, whose main function it is to regulate the adjustments which uninterrupted adaptation to the ever-changing conditions of the outer world requires.

Thanks to this organisation the mind, it is true, makes use of all the previously established psychic tracks, but at the same time, as we have seen it, it is the prisoner of its recollections, and we have been able to speak of a psychic automatism only differing from animal muscular automatism in degree.[1]

[1] At the moment when I thus described this conception of the psychic apparatus, which reminds one of delicately combined antagonistic forces of the intricate mechanism of which the conscious ego has not been warned, I had not yet read the very interesting *Papers on Psychoanalysis*, by E. Jones (Ballière, London, 1920, 2nd edition).

This distinguished psychiatrist happens to have described in his chapter on repression the same mental phenomenon and in a manner which might give rise to suspicion that I have committed a plagiarism, or at least that my conception of repression is only a reminiscence of his. Fortunately my learned colleague could bear witness himself that such is not the case. After this declaration it will be rather curious to read the other description, which starts from the medical point of view:—

"We cannot but be struck by the purposiveness of most of the ordinary acts of forgetting. To have one's consciousness burdened with all manner of irrelevant memories and other mental processes when one is concentrating one's attention upon a limited problem of the moment would evidently be highly deleterious to one's efficiency in dealing with reality, and I think it is the generally received opinion among psychologists that this is the direction in which we have to seek for the further understanding of the ordinary problems of remembering and forgetting. With the

Indeed, what does "to think consciously" mean? Is it not to know beforehand all the consequences a projected reaction might have? Is it not to dispose of memory in an abbreviated way, as I have shown already? Is it not to get, so to say, into a state of permanent recollection?

But we know, on the contrary, that if we no longer heed what happens around us we gradually sink in a state of a deeper and deeper oblivion, namely, into sleep. Memory thus suggests the image of an apparatus under pressure, due to the action of psychic energy, which revives the records of the past but at the same time judges which elements are to be set free and through what channels.[1]

Let us now see what happens when the individual voluntarily surrenders adaptation to his surroundings, which occurs when he decides to sleep, for instance. Part of his psychic energy, which presided over the important function of adaptation, becomes disengaged, and we will for a moment abandon it to its fate.

But, at the same time, the energy which maintained the balance in his memory relaxes, because the latter no longer needs to be set in activity without interruption and in accordance with strict rules. And, indeed, we have already seen that in day-dream and in dreams (and in certain mental diseases) reduplicative memory has free play and the ideation in images comes into its own again.

mechanism of repression already established for the purpose of excluding from consciousness various disturbing mental processes—for it should not be forgotten that repression is in action from the earliest periods of life—it would seem only natural that it should be seized upon and employed for the more utilitarian function of excluding irrelevant processes also when the time comes for the application of the mind to the problems of reality. Indeed, the disturbance to consciousness caused by the intrusion of these irrelevant and useless thoughts might without much exaggeration be conceived of in terms of the pleasure-principle itself, as a mild variety of *Unlust*. Be that as it may, I suggest it is more than possible that ordinary forgetting is, at least in part, brought about by a tendency which is a development of repression in its original sense. For the sake of convenience one might perhaps speak of 'hedonic repression' and 'utilitarian repression' respectively" (pp. 118–119).

[1] This difference will receive due attention in the next chapter.

In my study of day-dreams I have tried to prove that all our castles in the air owe their edification to a secret wish, and in a general way (as Freud has proved for the dream) we may state that when we give up our will-power, or when we lose it as a result of the influences which we are subjected to, wish takes on the supreme direction of our psychic operations. At any rate, this is so in the case of inspiration. Now, what happens when ardour becomes the regulator of psychic mechanisms which are no longer characterised by the rigidness imposed upon them by consciousness? It is that, if creative ardour (which is only a special form of the tendency to adaptation) is violent, as in inspiration, it disposes of all the energy which was before directed towards the adaptative systems. This wish, thus reinforced, draws from oblivion and revives the mnesic elements (or complex elements), but it hardly ever awakens more than two at a time. However, the attraction exerted by previously established psychic paths has ceased; the automatism is abolished.

Inversely, the mind falls back upon thought by images (repressed at the conscious state in favour of thought by conventional word-symbols), and may follow the devices proper to this primitive mode of thinking.

Fore-conscious intellection thus has at its disposal the maximum of psychic energy or attention to concentrate upon revived mnesic elements; it is no longer bound by ancient syntheses which remain in oblivion; not only does synthetical memory no longer trouble it, but the latency of duplicative recollections is equally complete, and it disposes of the concrete mechanism constituted by thought in images. We understand since then why, as H. Poincaré expressed it, "the unconscious in invention does not accomplish the mechanical work performed by automatism." Still, there are some other factors to consider. Not only the procedure of unconscious judgment which we recognised in previous discussions, and which is uniform throughout the whole animal series, remains at its disposal, but, as we have

seen, it may bring the use of language over into the fore-conscious level, and also the only conscious synthesis of use in attaining its aim, so that it profits at the same time by the advantages of two different states of consciousness. Invention is consequently the result of the collaboration of both our states of consciousness; or better still: invention is the result of intellection in a state of undifferentiated consciousness.

Involuntary absent-mindedness, on the contrary, differs from the voluntary letting-go period in that it is the result of a conflict between the two states of consciousness, in which the most primitive prevails.

In short, the advantages of fore-conscious thought, which leads to invention, may be summed up thus: a greater power of oblivion; a means of evocation which seems the stronger for the absolute forgetfulness which accompanies it; and the gift of representation in moving images. So that inventing means to forget the dissemblances and to objectify the resemblances; it is almost an appropriate forgetting and remembering. Indeed, all thinkers know that to create new things one must be able to forget nearly all that one has assimilated on the subject.

Conforming with the programme which I have set myself above, I must also devote a few words to day-dreaming in connection with inspiration. After what has been said I need not insist at any length, for the reader will already have noticed the analogies by himself. I might summarise these as follows: day-dreaming is a process of intellection in which all factors, which make of inspiration a superior product of intelligence, are traced back, but are mixed with all the defects resulting from a relaxation of attention, of a lesser quantity of psychic energy spent on its elaboration.

In invention the reinforced wish reminds us of the animal on watch for its prey. In day-dreaming the wish is weak to the point of not preventing us from falling asleep, which is a proof of complete disinterest of any conscious aim.

But the fundamental difference is that the day-dream applies another method of synthesis than inspiration, for it constitutes especially a search of means. It is true that it sometimes gives occasion for the establishment of a new relation between two mnesic elements (as in the phantasy of page 70), but that is pure hazard, I believe. The wish which provokes it hardly ever acquires the strength which animates an inspiration, so that, like an animal, the day-dream often changes its aim and takes unexpected leaps. Whereas in invention the synthesis which unites the mnesic elements is never lost sight of, a day-dream often makes use of faint or absurd resemblances (as in the phantasy of the flea), which reveals a recourse to inferior synthesis which conscious reason would reject, but which remind one of those of children and the insane or of trained animals. It is as if the superior syntheses had fallen into oblivion and that only those of a more primitive type had subsisted. As in the straying of the subject, the mind is content with simple assonances to pass on to a different order of ideas, whereas reduplicative memory is fully revived on occasion. Lastly, visualisation plays a more important rôle. The same characters, pushed to a more pronounced degree of absurdity, apply to night dreams.

At the conclusion of this chapter I would still call attention to the important rôle which our affects play in the different operations of our mental apparatus, and particularly in invention. It is thanks to the desire to find that we persist in carrying within us, always near the threshold of consciousness, the problem which we wish to solve. It is the same wish which, by the discovery of a sudden similarity combined with a happy visualisation, ends by solving it, as our will contributes nothing to it. It is still the wish which warns us of the unfruitful attempts of our second self—at least, when we have learned to observe ourselves—which informs us that the result is near, and which, when the fore-conscious search has at last succeeded, announces the

happy tidings to our sentimental ego.[1] The joy of finding must, moreover, be a sentiment common to the entire human race, if we think of the enthusiasm with which youth, above all, accepts novelty; it is as though it awakened in their minds a tendency old as the world. And how well it counterbalances the misoneism of the elders born at the same time with it! The mind thus lodges side by side many contrasts: the misoneism next to the eagerness for novelty; the recall of recollection next to the activity of oblivion; the spontaneousness of memory counterbalanced by repression; will sometimes vanquished by wish or passion, and so on.

But what often constitutes the object of my musings is the singular tendency which characterises the conscious man of never turning his attention towards his feelings. He reminds me of psychologists who have not been struck by reduplicative memory except in cases where it manifested itself in an obviously exaggerated fashion In the same way, we sometimes direct our mental glance inwardly, to find that we are downhearted or worrying, etc., but only by exception. Most frequently we are pleased to say: "I am charmed," at the sight of a friend towards whom we bear a real affection, but without noticing that we thus utter a feeling emerging from the deepest depths. It is really when the affects of our unconscious cause us an agreeable surprise that we begin to wonder if we really have a second self, who thinks, acts and feels for us, and incessantly watches over us.

But next to the happy inspirations which it brings us, this second self also presents another aspect of which we are inclined to lose sight. In the course of a human life it conceives many ideas which carry the mark of

[1] I have distinguished two stages in intuition: (1) the warning by our affects which may anticipate the other phenomenon during an appreciable period of time ("while we are writing an essay," says ROMANES, "how often do we not feel that a certain idea is, so to say, on the point of being formulated, though it be a truth we are not able to put into words immediately"); (2) the acceptance into the consciousness of the conclusion of the thought, the intellectual phenomenon.

the beast and present themselves at the threshold of consciousness. But we hardly deign to acknowledge their existence. We immediately repress them and refrain from listening to the animal, which suggests actions reproved by morality and social conventions. They have no less been formed, and each will be convinced by self-observation that they are the expression of wishes—bestial sometimes, but invariably reproved by our civilisation. This is the other and unpleasant side of the medal, of which inspiration reveals only the beautiful aspect. With as much joy as we admit invention into the field of our consciousness, with so much energy do we defend the entry against animal thoughts created by the beast that is dormant within us. These repressed thoughts are sometimes revealed by a gesture, a word that escapes us, and psychoanalysis studies them under the heading of the psychopathology of everyday life.

But sometimes also this repression leads to symbolism : the exteriorisation of the repressed wish then comes back under a disguise. In this way we find that those poets who entered into immortality, thanks to their love poetry, are amongst those who have had unhappy amours. Their non-satisfied wish not having met the proper object has externalised itself in admirable verses, which make the unacquainted think that they must be the happiest of lovers. But I must stop here, as those considerations would lead us too far from the subject.

The conscious ego not only never chooses as the subjects of his observations our affects and the ideations which they provoke, but not even the psychical mechanism obtains any consideration. We are content to accept the good offered to us by the unconscious ; we translate it into words, or we repress its products, if they are deemed unsuitable ; but we never recognise its existence. It is the invisible servant whose offices we accept with the same unconcern with which children accept their parents' kindnesses. It is too natural to appear worthy of attention. But this attitude does not satisfy the

psychologist who intends to inquire exactly what the layman neglects to consider.

I must also protest against the opinion that inspiration must be impersonal, and as Geley explains it, "totally independent of acquisitions."[1]

All the previous discussions prove the contrary, and I may sum up my argument thus: For me, invention is the pendant of obsession. The only difference which separates them is the nature of the affect which causes the fore-conscious ideation, and which is agreeable and accepted into consciousness in the one case and disagreeable and repressed in the other. But who would say that obsession presents an impersonal character? On the other hand, what is more personal than the concrete way of representing the intellectual elements in the act of fore-conscious comparison? Have I not been able to prove that in the first of my observations (pp. 135–137) the form adopted for this concretisation was determined by a reading I had just finished?

As for Geley's assertion, which tends to prove that without memory there is no intellection: since his assertion this work has been wholly and solely a protest against his way of conceiving inspiration.

At the moment of closing this chapter, I would still observe how far wish, responsible for inspiration (which is but a specialised, humanised form of the tendency to comfort), acts as a powerful factor of adaptation. Indeed, as it operates beneath the threshold of consciousness (with the result that except when it reaches a happy conclusion it in no way disturbs its usual functions of accommodation to the surroundings), it must have been of prime utility in the history of organised creatures. Moreover, it operates with recollections, in the absence of natural objects, of the obstacles to be vanquished, without being urged by circumstances to achieve instant success.

But this is not yet all; we have traced back the same affect in the analysis of perception, and in that of

[1] G. GELEY, *De l'Inconscient au Conscient*, p. 140, *op. cit.*

conception too, as in invention, and we have each time been led to admit that next to the internal factor the surroundings constitute the other source whence the ego draws the elements of its intellections. For these several motives we cannot fail to admit that wish, the tendency to adaptation, the vital force, common throughout the animal scale, has been one of the most important factors of mental evolution, especially from the moment, impossible to determine, when affect became independent, for its awakening, of external excitation; as soon as the psychic accent shifted from the non-ego to the ego.

Lastly, we may imagine also what elements lie at the root of the analogy which has been permanently established between the mentality of inventors and artists on one hand and that of children on the other. They all have the gift of visualising with the greatest of ease, a quality which slowly disappears with age, just as we remarked previously the gradual regression of reduplicative memory as a means of apprehension of the outer world. They all strike us with the instability of their attention, which, as we have recognised, constitutes a characteristic of affective ideation. And they all possess a remarkable faculty of not taking into consideration habitual syntheses, for avoiding beaten (psychic) paths—the former by dint of inexperience, the latter by their power of oblivion.

We may, indeed, conclude from this study of the "inner process," that from the moment it abandons psychic automatism, which is its ordinary form, human conception is exposed to end by obtaining results of inferior quality, except in inspiration.

Here, again, the Tarpeian rock is near the Capitol, and the wisest plan is to keep to the middle course, to do as everybody else. And to all affective conceptions which do not bear the mark of superiority we may apply Freud's words: "We have previously found, empirically, that the incorrect processes described (as to dreams) are enacted with thoughts (recollections) that exist in repression. We now grasp another point of the con-

nection. These incorrect processes are those that are primary in the psychic apparatus ; they appear whenever thoughts (recollections), abandoned by the fore-conscious occupation, are left to themselves, and can fill themselves with the uninhibited energy striving for discharge from the unconscious. . . . These processes, called 'incorrect,' are really not falsifications of normal defective thinking, but the modes of activity of the psychic apparatus when freed from inhibition."[1]

[1] Cf. S. FREUD, *Interpretation of Dreams*, p. 480, *op. cit.* I differ from FREUD in terminology only, because this study has compelled me to pick my terms and to establish a careful distinction between "recollection" and "thought."

CHAPTER IV

UNCONSCIOUS MOVEMENTS

Unconscious movements : examples of unconscious movements in man—They manifest a relaxation in repression—Comparison with animal automatism—Significance of the lapse of intelligence—Reduplicative memory is the psychic replica of automatism in the animal—The acceptance of the idea in consciousness is the psychic equivalent of its passage into the motor system—The repression of affective movements takes place at the unconscious stage also.

THE foregoing chapters have been devoted to the study of the mental phenomena which correspond with the two first phases of the primitive cyclus : " outer excitation—inner process—motor reaction." It is to the examination of this last phase that I will devote the following pages.

Psychopathology has long ago shown that man, placed by illness under inferior psychological conditions, may be led to react irresistibly, automatically, following syntheses which have already been organised at a moment when the mind was more powerful. In the same way, Janet has shown that this psychological automatism was in close relation with the faculty of perception, that is, with one of the conscious faculties : " We now foresee that, in lucid moments, the movements will follow the general progress and that the abulia will disappear. If Marcelle succeeded in reading two lines unknown to her previously, and was able to understand them, it is useless to verify the state of her movements ; I will guarantee beforehand that they are correct and that she unhesitatingly takes up a new object (whereas during her crisis she cannot grasp unfamiliar objects). In fact, I have always noticed a parallelism between these two

phenomena. *" Perception and the volition of movements are at bottom but one and the same thing : one single mental operation."* [1]

This problem will be resumed at the point where he left it and an attempt will here be made to advance one step further towards its solution, starting from the last data of science as a basis.

Janet's patients presented a profound disorder in their conscious mental activities. But the simultaneity between the disturbance of consciousness and the automatism of hysterics, which has often been observed, ought to have been sufficient, even without the experience of the French psychologists, to elicit the hypothesis that between the two phenomena an intimate relation must exist. For we all have, indeed, a spontaneous tendency to apply the method of concordance. Moreover, we have frequently met with instances in which there was question of purely mental operations, defectively executed by consciousness, of automatism, psychic but not muscular, without the slightest suspicion of any malady being justified. There is no doubt that if we could analyse cases in which a normal subject, perfectly balanced, manifests motor automatisms of a kind comparable with those of Janet's patients, the comparison would be of a nature to throw a vivid light on our problem.

It so happens that I possess in my collection a great number of observations suitable for such a comparison, and I begin by communicating a few of them now. Among them there are some which, it is true, have been used before, but that takes away none of their force.

(1) I am with my son at the doctor's, when at a given moment the following request reaches my ear : " Now breathe deeply." I soon find that I am carrying out the order more perfectly than my boy. The thought of breathing has invaded my muscular system against my will.

(2) A lady makes her daughter recite a piece of poetry for me. I notice by the movements of her organs of

[1] Cf. P. Janet, *Névroses et idées fixes*, T. i. pp. 51–52, *op. cit.*

speech that the mother recites also without making her vocal chords vibrate. Here again the thought is externalised through motility.

I have since observed that many people thus repeat, with visible movements of the lips, words which they attentively follow. Others do so while reading.

(3) Billiard-players usually bow the upper parts of their bodies in the direction which they wish their ball to follow after they have struck it; at least, when they are following its course with anxiety. Their intention invades their muscles without their knowledge.

(4) I am talking to a lady sitting on a sofa, who looks me in the face during our conversation. I notice her rubbing the corner of her eye with her fore-finger. Unwittingly I imitate her movement, immediately become aware of doing so, and smile. She wonders, and asks me the reason for that out-of-season smile. So I can but tell her that I can guess what she has been thinking of during my speech. As our acquaintance is quite recent—I had been introduced to her half-an-hour before only—she looks at me with an incredulous smile. Her features, however, soon express undisguised surprise when I explain to her that she has been rubbing the corner of her right eye, and that this movement is a consequence of her noticing in the corner of *mine* some white mucosity, such as now and then gathers there, and which she wanted me to remove. She frankly admitted that I was quite correct in my supposition.

(5) My daughter comes into my study and stands in front of my desk; she asks me in pleading terms to do her a favour—to take her to a concert in the afternoon. While she is doing so she sketches unawares a characteristic movement of abduction and adduction with both arms, which makes me say to her: "Are you thinking of swimming?" She stops her argument with some surprise, but as she knows the nature of my researches she explains at once that she was thinking *in petto* when she spoke to me: "If we go to the concert I shall not be able to go to the swimming-bath."

The girl reminded me of Perrette, the milkwoman in Lafontaine's fable *La Laitière et la Pot au Lait.* Lafontaine writes of the milkwoman, "Perrette saute aussi transportée," after having told us how, in her fancy, she saw her calf jump about "au milieu du troupeau," a symptomatic action which causes her jug to fall and destroys at once all her air-castles.

Here is an observation of a more dramatic character, which proves that even the most hidden wish may borrow the muscular system to seek an outlet :

(6) The scene is played at a married friend's house. He worships his wife, though clouds very often darken the conjugal sky. He is very excitable and believes his wife's reproaches, to the effect that he is bad-natured, to be true. For many weeks they live as a household of three, so to say. A friend comes to see them daily ; he makes music with the husband and goes shopping with the wife. But he is ugly, not very communicative, and looks nondescript and insignificant. The husband, moreover, has complete confidence in both parties. One day, while paying them a visit, the husband and the friend play a symphony of Beethoven for me, who am seated on a sofa in a far corner of the drawing-room, the lady standing behind them on the friend's side, to turn the pages. At the end of their execution the wife, in a state that might be termed distraction and in the course of which I afterwards guessed that she was weaving an adulterous day-dream, did what follows : She was standing at that moment exactly behind the friend. She bent down over him so that her bosom reposed on his head and sketched a movement, as if to embrace him. I surprised a slight, barely perceptible check in this movement, and she widened her arms to unite both pianists in the same embrace.

But the husband also had noticed the gesture, as he confided to me later on. He said nothing, but obtained a divorce a few months later.

(7) When sometimes I accompany my children to the pictures, I never leave the hall without having enriched

my collection of observations. The other day the film represented a dramatic scene of the Far West. Two men, on the floor, were fighting to reach a loaded revolver nearly within reach of their hands. While the opponents made the most desperate efforts to reach the object on which their life depended, each effort being immediately annulled by the opponent, I followed the procedure with the greatest attention, with an infantile interest. Suddenly I *found myself making movements of the shoulders.* I became aware that I was participating in the fight; that I was putting myself in the place of the man on the screen who had my sympathies, and was making inner efforts performed in imagination; but I was also making, with my body, the movements necessary to reach the revolver. Then the charm was broken, of course; but I could not restrain a smile, which, however, soon made room for the satisfaction of having been able to observe unconscious movements in myself, as I try to observe them in others.

Upon another occasion, the pianist of the orchestra, not a very good one, started playing in incorrect time (I am myself an amateur of music and have a very highly developed sense of rhythm). On this occasion I found myself making efforts to induce the bad artist to play in correct time, as though I had been the conductor. At the same time I found that I was executing with the top half of the trunk rhythmic movements indicated by the measure in which the piece was written. Fortunately the hall was dark, and I was in a box at the back!

(8) A lady tells my wife that her daughter has been safely delivered. And she adds this typical detail: "I was unable to remain in her room; I have undergone a severe operation in the abdomen, as you know, and the efforts which I made involuntarily, as if to help her, caused me such pain that I had to give up staying with her."

Let us remark here that the distinction between voluntary and involuntary muscles is not absolute and differs in kind.

We may sum up these different observations by saying

that they seem to prove that in each case the consciousness has been overtaken. As with hystericals and somnambulists, there is the execution of movements of which the conscious ego is not sufficiently aware to stop them, and these reactions are produced along old, familiar associations exclusively provoked by affectivity.

The foregoing discussions have familiarised us with the phenomena of the spontaneous manifestation of the unconscious self and the function of repression which is charged with annihilating their effects and actions. Therefore we must stop no longer at the preliminary considerations, and we might on the contrary at once enter into the heart of our subject.

In the preceding pages we have successively observed and analysed the following psychic mechanism :—

(*a*) A spontaneous revivification of reduplicative or synthetical memory is in relation with a corresponding function of repression which neutralises its effects and regulates them in such a manner that we may, in the act of voluntary thought, or in the act of simple recall, alternately and arbitrarily have recourse to the one or the other. We have also seen that when in the psychic apparatus the voluntary tension is diminished, be it by illness or by will, the more primitive of the two is the last to disappear and renders us relatively the least services.

(*b*) With the abundant and spontaneous ideation provoked by our wishes beneath the threshold of consciousness corresponds an activity which rules the access of the results of this intellection into consciousness : it may open the gate to the synthesis qualified as useful by intuition ; it sends back into the depths of the unconscious (where they follow another path, which I will not try to describe here) the conceptions which result from inopportune or reprehensible desires. But when the mental energy decreases this affective ideation has free play, only the entry into the conscious field remaining closed ; at least, in the normal individual.

If we consider the above instances in the light of these mental procedures, we are naturally led to suppose that

they reveal a third aspect of the mechanism of repression; indeed, the spontaneous movements which I have observed all indistinctly strike us as "having escaped" the persons who have performed them. "Ce mot ce mouvement m'a échappé." A movement, a word which has *escaped* the speaker—and a word also results from the co-ordinated movements of the organs of speech—such is the usual expression which the talkative French use to designate the phenomenon in question; even the vulgar expression already grasps the conception of repression.

For it is a current observation that we are always restraining ourselves from acting; but it is only when these efforts go beyond a certain limit—especially when violent feelings, which we can hardly succeed in repressing, assault us—that the delicate mechanism which constitutes consciousness is put out of gear. Then the inhibition of motility is overcome, will gives way to affect, the second self overpowers the conscious ego, and the result is an invasion of the motor system by the affective conceptions.

However, when nothing threatens our mental balance nothing any longer warns us that this function of repression goes on automatically, as well as the other psychical operation which we have already studied. It is no less active for not being directed by volition. But we have seen that this mode of repression is liable to be surprised as well as the others. In the same way as a recollection may oblige us to repeat eventually an experience which has moved us, or as a subliminal idea may irresistibly absorb us, so motor repression may be surprised and let an inner reaction pursue its course into the muscular system.

The idea that one of the functions of consciousness consists in repressing the spontaneous movements is far from new. As a proof we have this quotation borrowed by Ribot from Ferrier (*Les Fonctions du Cerveau*): "The faculty of fixing the attention and concentrating the consciousness depends on the *inhibition of movement*. While we are busy with an attentive ideation we suppress

the actual movements, but we keep in a more or less considerable state of tension the centres of movement with which the different sensory factors of ideation are united.

"*In repressing the tendency to outer diffusion in actual movements we increase the inner diffusion* and we concentrate consciousness. (My italics.) For the degree of consciousness is inversely proportional to the quantity of active outer diffusion. In the most intensive attention, all movement which would lessen internal diffusion is equally inhibited. When we think deeply the automatical actions themselves are stopped, and we may observe that a man who, while walking, falls into deep meditation, arrests his steps and remains motionless." [1] Ribot, in his turn, adopts this point of view and develops it, as will be shown by further citation.

We may thus admit this first point, that when we fully dispose of our intellectual means consciousness prevents the invasion of our muscular system by the mental representations having a tendency to abreaction, for completing the original cyclus, which has so often been mentioned in these pages; or, as Janet has it: "Every sensation, every emotion tends to develop, to complete itself in the manifestation of movements and action, from which it is inseparable."

This is now also the moment to recall the opinion of Bergson: "The brain maintains the balance between outer excitation and motor reaction."

But this first conclusion gives us matter for reflection, for it shows how this complete cyclus accomplished by man (perception without warning of the conscious ego—conception without this ego's participating—motor-reaction without awareness) brings him nearer to the animal reaction, where all these phenomena happen most frequently without awareness. Since then a comparison between these two ways of reacting obtrudes itself.

Usually this question is soon disposed of by saying that the animal reacts automatically or by reflexes. Still,

[1] Quoted by Th. Ribot, *Les Maladies de la Volonté*, p. 160, Alcan, Paris. 1887.

we must agree upon what this explanation implies. We again ask animal psychology to enlighten us. But before proceeding, and to avoid ambiguity, let us consider for a moment what distinguishes an automatism from a reflex. Among the numerous definitions which have been proposed, I prefer that of Grasset, which has the great merit of being clear: "Etymologically an act is called automatic when it seems spontaneous and at the same time is submitted to a severe determinism without variations and without caprices. . . . *The automatic act reproduces itself without the need of actual outer impulse.* That is what distinguishes it from the reflex act. . . . Here are thus the two elements essentially characteristic of automatic acts and distinguishing them from what they are not: *they are spontaneous, which distinguishes them from reflex acts; they are not free, which distinguishes them from superior psychic acts.*"[1] Without entering here into a discussion of both terms, we may still remark, and it is sufficient to our present needs, that according to this definition the same act may successively be automatic and reflex—closing the eyelids, for instance, a movement which may be spontaneously brought on by internal or external excitation.

This is as much as saying that we meet here with a distinction analogous to those which we were led to admit between Perception and Conception, which are both syntheses, provoked by turns by the non-ego and by the ego. For the following discussion it is thus of little importance whether we alternately use the words *automatism* or *reflex*, for this detail, not to be neglected in other circumstances, has no great importance for what will follow.

If we now question zoological psychology, we learn that in animal all action, intelligent at first, that is, executed with a certain degree of consciousness, later becomes automatic without the individual being conscious of it. It so happens that the behaviour of an animal towards a new reaction reminds us faintly in the beginning of what happens in conscious man, and later makes us think

[1] Cf. Dr. Grasset, *Le Psychisme inférieur*, p. 6, *op. cit.*—My italics.

of the cases where our conscious ego is taken by surprise as above. This is what Hachet-Souplet tells us on the subject: "It is very instructive to follow, with animals, the transformation of a reasoned action into a reflex action. Take, for instance, a cat which for the first time has succeeded in opening a cupboard; shortly after it has given this proof of intelligence—I mean, before the movements permitting it to open the latch of the door have been allowed by repetition to become secondary reflexes—if you replace the solid door of the cupboard by on open one with bars, the cat will only open the door if the cupboard contains a bait. Afterwards repeat the experience a great number of times, always putting in the bait, and you will obtain reflex movements of intellectual origin: the cat will end by opening the cupboard as soon as she sees it, though it be empty, and consequently without any reasonable motive for acting thus."[1]

Experiment thus teaches us that the animal manifests a tendency towards automatism. But this is not all. In the above case we might even suppose that in spite of appearances it is yet the unconscious ego of the animal which achieves the automatism, as in the eight foregoing observations it is the unconscious ego of the subjects which at bottom is the cause of the movements which escape them. But it seems that this animal automatism does not stop there. We still have recourse to the same psychologist: "When we teach any exercise whatever to a superior animal—for instance, to a dog—by means of persuasion, that is, by making him understand what he must do, we shall not fail to find that his movements, though conscious at first, if frequently repeated tend to become automatic. And it is easy to show that they happen, after a certain time, *apart from the will of the animal.* They end by becoming real manias, of which the reproduction is governed by *certain external influences*, such as a verbal order, a gesture of the trainer's, etc. We quote this proof of the relapse into unconsciousness

[1] Cf. P. Hachet-Souplet, *La Genèse des instincts*, p. 227, *op. cit.*

of the acquired movements, because it is very decisive and of the greatest importance."[1]

It is important, indeed, because it leaves no longer room for doubt. It is a reflex which the animal cannot suppress (unless under special circumstances to be examined later on). I see here a phenomenon which is the inverse of another already studied. When tracing a parallel between Perception and Conception, we were forced to admit that we were in the presence of two procedures of syntheses which offered in their mechanism the greatest resemblance, but with this difference, that in Perception it is the outer world which provokes the synthesis and sets memory and psychic energy on the move, while in Conception the initiative starts from the conscious or unconscious ego. I even added that things look as though the ego has succeeded in profiting by, in putting to its own use, the unconscious mechanism spontaneously built up by contact with the surroundings for the purpose of their assimilation. I then spoke of a displacement of the psychic accent from the non-ego to the ego; for we may imagine that the surroundings must be submitted to them before the organism learns to submit them to it.

Here, on the contrary, there would seem to result from the knowledge of zoological psychology the fact that the animal manifests also a quite contrary tendency: after the ego has conceived a manner of reacting, the psychic accent has a tendency to displace itself to the non-ego, which may then bring on reaction without the intervention of the ego, even in spite of the ego (cf. namely the observation of Hachet-Souplet in the footnote of page 32). It is as if reduplicative memory took possession of the entire synthesis and tried to reproduce the whole experience from the moment the first image of the film is recognised.

But a moment's reflection will sensibly attenuate the surprise which might be provoked by such a discovery, for we have seen in man a phenomenon comparable

[1] Cf. P. Hachet-Souplet, *Examen psychologique des Animaux*, p. v., *op. cit.*

with this spontaneous tendency. We have observed indeed, that the human mind is not entirely free in its syntheses. Evidently in the presence of an excitation it is not tied to one—we might say unique—reaction, as is the animal. On the contrary, man has the choice between a certain number of retorts, which grows with the degree of intelligence; but it is no less true that he has no choice outside these ancient syntheses, which thrust themselves upon him as they do upon the animal. Between the two there is only a difference of quantity and not of quality: at the top of the scale choice may bear on a certain number of ancient syntheses; on descending, the choices are reduced; but everywhere the past obtrudes itself with the same force, everywhere it tends toward reproduction. The difference, then, resides in the extent of the choice. (We have seen that the ego succeeds in apprehending more and more as psychism develops.)

But if from animal automatism the mind has in the course of evolution progressed to human automatism: if the psychic accent, instead of bearing on the non-ego and tending to the reflex, has gone over to the ego, which permits more choice, this result has only been reached by opposing to the tendency of reduplicative memory another tendency capable of keeping it in check, and giving the mind the occasion to pronounce for one or the other alternative. In other words, the passage of muscular automatism to psychic automatism leads us once more to presuppose in the mind a mechanism of repression or inhibition capable of provoking the necessary pause for a choice to be performed. This mechanism is found in the animal also, and it is again Hachet-Souplet who tells us of it:—

"But if consciousness is thus abolished is it not capable of awakening when it becomes necessary to the welfare of the animal, in cases, for instance, where by acting mechanically merely it would risk being wounded by the presence of an external object? This is what I have observed in the most decisive fashion in a wonderful

little Irish terrier, Paddy, whom I have had as my constant companion for fifteen years.

" Trained to certain exercises by persuasion, he executes them blindly. In this way, having the habit of jumping over a barrier at a certain point of the ring, he ended by making this leap at the same spot when the stile had been removed. This was absolute automatism : but if the barrier was placed in such a way that in jumping over it he risked hurting himself against any obstacle, he refused to leap ; the instinct of preservation was here powerful enough to wake up the consciousness."[1] Thus, under the stress of certain affects, the animal itself is capable of repressing and checking his muscular automatism. In these lines the author calls the affect which causes the inhibition the " instinct " of preservation. I feel certain scruples in using the term instinct, because it serves to design processes which have but a very vague resemblance to each other. I cannot approve of the term, except for the meaning of hereditary memory, for reasons to be developed later. But, nevertheless, we all understand what Hachet-Souplet means by the instinct of preservation. It is but a form of the tendency to preserve oneself, an aspect of the *élan vital*. Therefore, all motives which prompt a man or an animal to adopt a certain mode of behaviour and to reject certain others depart from the same principle and all are reducible to the same aim : the avoidance of pain, the achievement of pleasure, these two words being in their widest meaning, of course. So that we may say that the vital impulse which leads a living being to react against the outer world is the same as that which leads it to make a choice between possible reactions. This is a point whose discussion we will resume further on, for it is only the phenomenon of inhibition, as a preliminary condition to choice, that can be discussed here.

If we carry our thoughts back to the origin of life, we can imagine that the first choice of the living creature must have been directed toward these two points : con-

[1] Cf. HACHET-SOUPLET, *La Genèse des Instincts*, p. 228, *op. cit.*

traction or immobility. Now, however far we descend in the series, we may observe that under given conditions discernible by human intelligence movement or inertia do not appear at hazard, but following fixed rules; thus there is choice. There is at the same time repression or inhibition. It is difficult to imagine a uni-cellular being gifted with reduplicative memory, but let us ascend the scale and take the example, say, of the razor-shell, the *solen ensis*, mentioned on page 34. There it becomes admissible that the inhibition or repression of the animal is due to its individual experience, because it remembers—without being conscious of it—the unpleasant experience which awaits it on leaving its hole.

In short, we may conclude that repression is born at the moment when reduplicative memory alone has no longer sufficed to bring about adaptation. And, at the same time, when the unconscious judgment, of which we have spoken above, permits the recognition of the similitude between the external conditions and mnesic images, and leaves a free course to pre-established automatism, it is capable of the opposite decision in case of dissimilarity or of similarity, of which the animal knows the disagreeable consequences. This is what I wanted to express above when I said that repression is at the basis of choice. We may still render this conclusion in a different manner: from the origin onwards a judgment is necessary to permit motility to enter into action; the unconscious judgment of similitude. But we have also seen before that the judgment of resemblance and dissimilarity is at the origin of the synthesis which operates in Conception and Perception, which is to say that all the mental operations which we distinguish in human intellection are traced back to the genesis of animality. This is, however, only the confirmation of an opinion expressed already by other psychologists.

But mental history gives the impression that reduplicative memory plays in animal life a far more important rôle than in that of man. (I intentionally drop here the distinction between muscular and psychic memory, this

distinction being examined later on.) However, I believe that this is only so in appearance, and that the truth is otherwise. Indeed, the automatic repetitions to which we see the animal recur are found in man under the form of mnesic images, Indeed, we have been able to establish, in the analysis of the mechanism of Perception and Conception, that the mind incessantly makes use of reduplicative memory for estimating what will be the effects of an evoked mnemonic complex: in the fore-conscious state this recourse may evoke the complete revivification of the film that registered the experience, but in the conscious state the procedure is more concise, more abridged, because then the effect is reanimated almost at the same moment as the cause. This we examined at length in the foregoing chapter. But whether the mind follow the longest or shortest route, it remains no less true that in our attempts at solution, in our mental valuations, we do in spirit what the animal does with his muscles: we automatically revive an ancient mode of reaction.

It is precisely because we are able to execute this repetition mentally, because we can go through, in our brain, the reactions which an animal allows to pass through his motor-system, that we are capable of preparing for the future, that we are able to anticipate. But, as the animal also possesses the gift of anticipation, we may admit that the mental mechanism which permits them to do so is not essentially different from ours. It is probable that between the two there is only a difference of degree and not of nature: in the act of deliberate anticipation we dispose of more "films" than the brute.

At this point I propose to interrupt the discussion for a moment to state, for a first conclusion, that the psychic automatism of man does not essentially differ from the motor automatism of animals, and that the repression which inhibits our unconscious movements is parallel to a similar function in all the degrees of the zoological scale. It remains, then, to be shown how the memorial images of man can represent the real movements executed by the animal.

However, we cannot treat this question immediately, for I still have to comment upon a phenomenon which I have been unable to bring forward in the course of the argument which we have just interrupted ; this is, namely, the phenomenon of lapsed intelligence.

All the animal psychologists have insisted on the fact that the beast loses all consciousness of its actions once it is accustomed to them. This seems strange at first sight, undoubtedly, but the impression fades away if we compare the phenomenon with other similar ones, which permit us to appreciate its biological meaning. For just "as a boy needs to forget a thousand times the prologemena of all initiation in the dead languages in order to learn them thoroughly, so as to handle them easily later on without awareness, so he ends by reciting the declensions imperturbably as a gramophone ; similarly a soldier carries a rifle 'instinctively,' the pianist plays without looking at his fingers, and the versifier unconsciously moulds the words of a language in the form of a poem with fixed rules."[1]

We see, thus, that lapsed intelligence is not limited to animals only, but is a general mental phenomenon which ought to be interpreted from the genetic point of view. It must be the result of a mechanism which strangely recalls repression, as it has the consequence of bringing about the disappearance from our psychic horizon of that which at first sight should always remain within the reach of our mental glance.

In examining this problem of the fading away of conscious effort in man, as in the animal, there is an advantage in considering it first in the former, since we are more familiar with his psychology ; but we should then have to choose examples which would permit of a direct parallel with the behaviour of the animal. The problem of apprenticeship easily satisfies these conditions, for we may as well speak of animal training as of training for a profession. Indeed, what happens when an apprentice learns to handle a file, for instance ? At first a sustained

[1] Cf. P. Hachet-Souplet, *Examen psychologique*, etc., p. 153, *op. cit.*

attention is necessary to obtain the proposed result, and notice that he expends a muscular effort disproportionate to the effect to be obtained—an effort easily measured. What interests us especially is that he applies all his visual, muscular and tactile memory to his conscious task to such a pitch that he is unable to give his mind to anything else, and at the end of the day his mental fatigue is as great as his physical exhaustion. The workman who knows his work, on the contrary, obtains with his file all the desired results with a minimum of application of psychic or muscular energy. He files automatically, and his mind is so detached from his work that he can with all ease at the same time proceed to the most diverse intellectual occupations.

Thus appears the first advantage resulting from lapsed intelligence: the voluntary memory, no longer occupied with present adaptation, becomes available for further reactions or adaptations. I recall here that I have already written somewhere: "If synthetical memory, awakened by the wish in search of a new procedure of adaptation, constantly had to take a preponderant part in each act of everyday life, routine would not exist, and the mind would always be inventing without benefit to itself."

Systematic automatisation of physical reaction toward the outer world has set free and placed at the disposal of the mind sufficient psychic energy to build little by little a mental mechanism parallel with the first, a psychic automatism of which there has been question so often already, and which will still be mentioned so often. However, the process has not reached its ultimate development, for when the psychic memory is revived for some function or other it is no longer liable to be made use of with any of the other mechanisms which we know.

A second advantage of lapsed intelligence which is mentioned here reminiscently only results from the speed and the precision which reaction acquires.

From the fact that conscious procedures thus descend into the deeper strata of the unconscious there results an economy of time and of psychic energy. But it is

not without benefit to the individual. Each living being disposes only of a constant sum of energy. If this is entirely spent on immediate adaptation none is left for other mental mechanisms which have the same immediate aim. Indeed, the example of women who muse while knitting—of the inventor whose second self resolves a problem while his conscious ego is busy upon a set task—of the poet who sometimes stops his voluntary work to give outlet to the verses which his unconscious has construed during his bread-winning activities and without his awareness ; all this tells us that psychic energy, rendered free by lapsed intelligence, by the acquisition of automatism, is utilised elsewhere.

I have established above, with the aid of examples, that mental synthesis never stops, that, on the contrary, it pursues its course incessantly beyond the threshold of consciousness as long as life lasts. Though tradition old as the world has fixed the experience of the race in suggestive sayings, such as " Take counsel with your pillow," traditional psychology was not sufficiently aware that mental operations, like the other vital functions, never stop : they continue during sleep as during the waking state.

However, there are good grounds for believing the near future will prove that this unconscious rumination is as indispensable to intelligence as the act of entering into contact with the non-ego.

Apart from the speed of the reduplication and the economy of energy mentioned above as results of the abbreviation which results from lapsed intelligence, it is possible to consider this procedure of reduction from another angle still. Just as the conscious self makes use in the act of perceptual or conceptual synthesis of reduplicative memory, but only in a sort of telescoped fashion which places side by side the recollections of cause and those of effect, so we may see in the lapse of intelligence a tendency to approximate the reaction to the excitation, to reduce the internal process to a minimum. We might even advance that we are here in presence of two different

aspects of the same psychic phenomenon, which aims at a simplification of mental operations ; and that they are both a result of repression, of which we thus learn to know a new and a fourth function.

Lastly, we will mention—without insisting upon it—that zoological automatism results in making the animal acquire a stability in reaction, which in presence of the versatility of its attention we have considered as a psychic equivalent of will.

A mechanism as general as that of lapsed intelligence cannot be the result of an incomprehensible series of hazards, and the advantages which result from them, as we have just reviewed, force us to admit that we are, indeed, in the presence of an active function having a determined biological meaning.

We may for the present continue our discussion and wonder whether the images, which reduplicative memory puts before our mental eye, do not constitute the parallel of the muscular contractions of which the animal cannot free itself in certain circumstances.

Such, indeed, is the hypothesis which will be maintained with the aid of arguments drawn from the psychologists who have written on memory. We start from the conception that the animal which has the habit of executing a series of co-ordinated movements remembers this series with the aid of its psychic memory as well as with its muscular memory. We have observed the same phenomenon already, but limited to the world of ideas, when we remarked that reduplicative memory remembers unconscious syntheses in the order in which they are produced. I here invoke the authority of Van Biervliet, who tells us, in an oft-quoted passage, that " whatever be their nature, cerebral images are quantities of movement. These movements crossing the nervous centres must alter them and consequently leave a constant modification, a diminutive of the intense modification which is the actual image, and that not only in the cells of the periphery where representation becomes conscious, but also in the nerve-fibres which lead to or depart from

thence. Wherever a nervous current has passed from the organ of sense which first received it to the muscle in the contraction of which it results, it leaves a more or less profound alteration in the parts which it has traversed.

"It must be remarked that all this is not a hypothesis, but a truth established upon experience on one hand and the laws of mechanics on the other.

"When the problem of memory is considered, it is given generally an infinitely restricted meaning; most often only conscious memory in man or in superior animals is considered; that is, the memory of the superior centres of the brain. *But all solid or semi-solid parts of the organism retain it as well, perhaps better than the cerebral rind.*"[1]

Given an animal which, for a certain reason, is led to interrupt or suppress a given muscular reaction, we may without difficulty imagine that it has been able to repeat this action mentally. This amounts to saying that *thanks to repression the animal has gradually succeeded in making its psychic memory independent of its motor system.*

But whereas, at the origin, all intellection was closely associated with motility (another point beyond discussion), we can imagine that primitive memory was inseparable from movement.

By this simple comparison—long prepared, it is true, by the foregoing discussions—we come into possession of a key which will allow us to give a solution to many a mystery and to confirm the opinions emitted by the most famous psychologists and philosophers.

We first go back to our previous analyses, in the course of which, for reasons then detailed, I have maintained that in the fore-conscious state the mind has recourse to primitive modes of ideation proper to the animal stage. Among the reasons on which this opinion is based I must lay stress on this: that (as in the fancy of the flea) each time there was question of putting a suggestion to test, of having recourse to reduplicative memory, the images became animated, and my own person played, in imagination, an active rôle. In the same way, we

[1] Cf. J. J. Van Biervliet, *La Mémoire*, p. 128, Doin, Paris. 1902.

have found that the images used in the perception of the electric spark and in the inspirations were endowed with movement, but in a less pronounced degree. We find here that my hypotheses confirm one another: on the one hand, in the primitive mind images must be inseparable from movement; and, on the other, when images acquire mobility in the human mind, it is a proof that it reverts to a primitive process of ideation.

At any rate, we now understand why thought is the psychic equivalent of movement: psychic reduplicative memory began by replacing it, thanks to inhibition. And when the elements constituting the film are evoked by the procedures of synthetical memory to be reassociated, they keep their mobility, with a tendency to lose it as the faculty of thinking in words, and with abstractions, develops.

On the other hand, the hypothesis of the primitive simultaneity of the psychic and muscular memories, both reduplicative, helps us to understand this conclusion of Janet's: "There are not two faculties, one of thought, the other of activity; there is at all moments but one and the same phenomenon, always manifesting itself in two different manners."

In the same way we may explain the case of the sergeant of Bazeilles and all similar cases by a return to animal reaction, of which Hachet-Souplet's cat represents the type.

The same hypothesis also throws a new light upon my description of reduplicative memory as being more primitive and more characteristic of the animal than the synthetical, though still a constitutive part, and an indispensable one, of the psychic apparatus of man.

It is no doubt in this sense that we must understand this reflection of Dwelshauvers: "The error of most of the psycho-physiological theories consists in the fact that representative or intellectual memory is considered primary; indeed, *memory*, for him who studies its physiological nature, *is exclusively motor*."[1]

[1] Cf. G. DWELSHAUVERS, *La synthèse mentale*, p. 76, Alcan, Paris. 1908.

If this reasoning is admitted, this would perhaps be the moment to remind the reader that it was, I believe, the philosopher, A. Fouillee, who first called attention to the phenomenon we are considering here when he made the profound remark : " All idea is an inner representation of the act." It has, moreover, been taken up and developed by Th. Ribot, who returns to it in all his writings : " As the representation of a movement is a movement which begins, it may, when powerful, finish and become a real movement " (*La Vie inconsciente et les Mouvements*). " The fundamental principle which dominates the psychology of volition in its impulsive form, in normal as in morbid conditions, is that in *all its states consciousness always has a tendency to express, to translate, itself by a movement, by a deed.* This principle is but a particular case, proper to physiology, of the fundamental law : that the reflex is the unique type of all nervous action. Properly speaking, activity in the animal is not a beginning but an end, not a cause but a result, not an outset but a consequence. This is the more essential point which must never be lost sight of " (*Les Maladies de la Volonté*).

I refrain from any further quotations to conclude with Grasset, who has remarked, and with good reason it seems, that " if each volitional (and we may now add—affective) psychic process has a tendency to turn into a movement, the contrary is also true : motor acts give birth to the corresponding psychic disposition." This truth is not only proved by the study of hysteria and hypnotism : it is on this mechanism that rest most religious rites for the use of the faithful, and independently of all acts of faith everybody may observe this in himself.

I will still remind the reader that this theory also necessitates that the tendency towards movement (or abreaction) diminishes when thought operates with word-symbols instead of images of objects. As Ribot has it : " With abstract ideas the tendency for movement is at its minimum ; these ideas being representations of representations—pure schemes ; and the motor element diminishes

in the same ratio as the representative element." [1] This, perhaps, is what explains why abstract thought is possible at all. Indeed, all psychic energy, which is set free by the fact that the repression of the tendency to movement approaches zero, may be advantageously concentrated on the elements of thought.

But, inversely, the study of the unconscious allows us to observe that when the second self makes use of abstract words or expressions it has a tendency to restore to them a concrete meaning, to understand them in their proper sense, and not figuratively ; to restore their primitive mobility ; and this may give rise, especially if unconscious thought invades the motor system, to some curious observations. The literature of the unconscious offers a great many examples of this, but as they would lead us too far from our subject, I must refer the reader to the essays which deal with it specially.

In another order of ideas, when Wundt believes that the act of an animal which sees or hears another execute a familiar movement will equally tend to transform itself in movement (this has been experimentally confirmed), we may imagine what he means. It is a very primitive process ordinarily called " the instinct of imitation," but it is neither more nor less instinctive than all the other psychic mechanisms we have passed in review, and is due to a lack of repression wherever it presents itself. [2]

Normally, man is only able to repress the movements of which his conscious ego is warned voluntarily. Grasset explains this thus : " Polygonal (unconscious) psychism is much nearer to the motor act than superior psychism." But the case of the stutterer who pronounces correctly

[1] " The signs of writing evoke spoken words, which in their turn reanimate the images and the ideas ; it is representation in the second degree, and even in the third, if one reflects that the image is in its turn and generally the intermediary between the word and the idea."—A. Dauzat, *La Philosophie du langage*, p. 35, Flammarion, Paris. 1920.

[2] Not to draw out this chapter too far, I will say no more of the instinct of imitation and of mental contagion, to which, I think, this theory also furnishes the clue.

when singing, the patient who finds his way back when he thinks of something else, and other similar instances, prove that repression is a very delicate function which in normal circumstances knows exactly when it must inhibit and when give passage to the reduplicative tendency. But, let us repeat it, outside our voluntary repressions it is the unconscious ego which assumes this rôle day and night. But the latter may also work defectively and the muscular contractions to be inhibited may escape its control and take place unwittingly, as we have see in the observations communicated at the beginning of this chapter.

To conclude this discussion I will once more emphasise the rôle of repression. We admit that at a certain moment of mental evolution it has succeeded in making the psychic and muscular memories independent of each other. However, it is even more important than we have admitted heretofore, for until now we have considered one side of the medal only. Indeed, we have only examined the advantages resulting from the immobilisation of the motor system. But if we do examine the other side, we see that, instead of immobilising motility, the disjunction which we are studying here has also made it possible to set the muscular memory in activity while leaving psychic memory at rest. The mind has profited by this possibility to confide to muscular memory the greatest possible number of automatic acts with a minimum of intervention of psychic memory (in the form of conception). But it has thus set free a great quantity of psychic energy, which has allowed the process of entering into contact with the non-ego, to be perfected : and has developed syntheses and intelligence. We thus see the whole significance of the progressive inhibition of automatic movements in the evolution of the mind.

We have thus completed the comparison between the psychic mechanisms which enable the animal as well as man to anticipate events. Still, my task is not yet ended, for there remains another problem to be examined : I believe that the psychic energy set free by a more and

more perfect inhibition of motility has been made use of for the edification of a new mental mechanism : thought in images independently of movement.

This hypothesis puts into other words the following thought of Ribot's : "Volition, which psychologists have so often observed, analysed, commented, is thus for us only a simple state of consciousness. It is but an effect of that psycho-physiological work, so often described, *of which part only enters into consciousness* in the form of a deliberation. Moreover, volition is the cause of nothing. The acts and movements which follow upon it result directly from tendencies, feelings, images and ideas which have ended by co-ordination in the form of a choice. It is from this group that all efficacy proceeds. In other terms, and to leave no room for doubt, *the psycho-physiological work of deliberation, on one hand, leads to a state of consciousness ; volition, on the other hand, to a combination of movements or inhibitions*" (my italics).[1]

We know that the animal may inhibit its automatism under the influence of certain affects and proceed to another choice, that is, its mind stops the tendency to spontaneous movement and performs a deliberate one. But as we have already argued that conception is the psychic equivalent of a movement, we may pass over the distance which separates the animal mind from the human. Nothing for the present prevents us from admitting for a time, that at the moment of the arrest and of the choice the animal has a flash of consciousness, of which the permanent conscious state of man is but the development. This proposition will be the subject of a careful investigation, in which we shall go through the different functions of consciousness. Let us here start from this provisional basis. I imagine consciousness, as far as it represses and directs our movements, as a function superposed on the primitive system in which the psychic elements, under the form of memorial association or of a new synthesis, easily pass into motility, even too easily. But this inhibiting function of consciousness shows a difference from

[1] Cf. Th. Ribot, *Les Maladies de la Volonté*, p. 175, *op. cit.*

the corresponding one in the animal. After all, when Hachet-Souplet's dog refrains from leaping through the ring, this inhibition bears upon its muscular reduplicative memory and the stopped reaction is replaced by another movement as well known as the first. The animal does not invent a new movement. (The eventuality of a new association of muscular contractions is not wholly excluded, but it is an exception and leads us back to invention, which we cannot consider here.) The repression of the animal and the accompanying flash of consciousness at bottom lead only to substituting one reduplicative recollection for another.

But the man's conscious ego represses more than that. It not only inhibits the muscular reduplicative recollections, which reappear in cases of disease, such as that of the sergeant of Bazeilles. It also suppresses nearly all movements resulting from affective ideation—the formation of new syntheses with the aid of memorial elements—which goes on beneath the threshold as abundantly as in the field of consciousness itself. And the former are those which we have been able to discover in the observations with which we have opened the discussion in this chapter.

We may still express this idea otherwise by saying, just as our ego may dispose of psychic memory in two different manners (either by using an old revived synthesis or by making a new one), so also may it dispose of muscular memory by giving the start to a pre-established muscular co-ordination or by performing a new co-ordination with old elements. Consciousness, however, has the power of inhibiting both sorts of movements.

Indeed, it is a well-known fact that fore-conscious movements increase with the degree of distraction and diminish when attention is more focussed on a deliberately chosen subject. Let us render in our own terms these expressions, borrowed from descriptive psychology, and which hide the mechanism we would submit to analysis.

To be distracted or wandering in the mind means that the fore-conscious ideation is vigorously pursued to

the disadvantage of voluntary thought; that the second self lays hold upon the greatest possible portion of the available psychic energy. To concentrate on a freely chosen subject means that all available psychic energy is directed by the conscious self, and at its free disposal.

When affective ideation predominates, the conscious ego is placed in inferior conditions as to repressing the movements by which this intellection tends to be exteriorised. When, on the contrary, intentional ideation pursues its course with the maximum of mental energy, the inhibition of movements is complete. There thus seems to be a correlation of which one would like to discover the nature.

Ribot seems to suggest a bifurcation which would exist in the prolongation of affective ideation. This would lead " on one side to a state of consciousness, and on the other to a group of movements and inhibitions." It would be as though thought could pass either through the consciousness or excite the motor system.

But after comparing our two modes of intellection we find a remarkable difference between the elements with which our mind operates in both cases, and which are, at bottom, the same, but used in two different states.

Indeed, the mnesic elements are characterised by mobility, concreteness and affectivity when the fore-conscious ego associates them; and these same elements seem more fixed, more abstract and unexciting, when made use of deliberately. It is as if two different persons had treated them, one giving them life and movement, and the other, on the contrary, depriving them of both. Or, again, we might be tempted to suppose that mental energy, used by the fore-conscious ego to the intense revivification of mnesic elements, is more deliberate when the conscious ego reanimates them. (One might also describe this phenomenon by saying that it is as though mnesic elements had, by penetrating the consciousness as in an electric converter, lost a part of their impulsive force, so that afterwards they pass into the motor system with greater moderation.) We may now ask where the surplus of energy, which has

disappeared, has gone to. It is again Ribot who calls our attention to the circumstance that the more we ascend the scale of being the more the act of deliberation, as observable by an interested witness, is protracted. This fact of observation leads us to suppose that, between the inhibition of spontaneous movements and the gradual protraction of the set of deliberation parallel to it, there is a correlation which justifies the idea that the mental energy set free by inhibition has been utilised constructively to build up and perfect the mechanisms of synthesis with which we are acquainted: and if in the same way the conscious self proceeds sparingly with the energy of the individual in the revivification of mnesic elements, this economy renders it possible for a greater number of elements to be successively brought before the mental glance in the forum of the mind. So that energy economised from vivacity and mobility is used to enlarge the field of spiritual operations: Perception and conception always encompass more and more elements of the outer world and incorporate them in the mind; and the number of syntheses to which they give rise is always growing. (The perfecting of the function of synthesis supposes also the development of its constitutive mechanisms, which in their turn may have profited by a better distribution of the available energy.)

Later, when the conscious ego has pronounced its *fiat*, the motor system is let loose as in more primitive stages and the mind passes also from idea to act, but the latter is henceforth characterised by the absence of irresistibility, and is less impetuous.

We may summarise this argument by saying that in consequence of the acquisition of consciousness it would seem that the unique moment, the "idea-movement," the moment of incontestable impulsiveness, would have developed into a protracted deliberation, followed by a direction of the muscular contractions in the case of a new movement or a simple release in the case of an old reaction.

In reality, the mobility inherent in mnesic elements, when awakened by the fore-conscious ego, has disappeared

when it is the conscious self which evokes them. This proceeds probably from the circumstance that the latter often thinks with "representations of representations, schemes, abstract words." One thing is certain, namely, that intentional thought moves us less than affective ideation. There is to this rule but one exception, that is, when we conceive voluntarily but with enthusiasm, which is to say that voluntary thought and affective ideation, conscious and fore-conscious ego, will and wish, tend towards the same and the only aim and lend each other mutual support: all available mental energy is focussed on the aim to be reached. I repeat once more that all this has but a theoretical value, and that I am well aware of it, but, theory for theory, I prefer this one. Besides, what more does it propose than to unite with a single thread a great number of problems long known to psychology, but not yet examined from a certain special point of view.

Moreover, a brief retrospective glance will enable us to see the ground we have covered since we undertook this inquiry and the uniformity of our point of view in the different discussions which we have hitherto sustained.

We have found up to now that in accordance with our present conception the vital impulse has brought into the course of mental evolution:

(*a*) The repression of useless or harmful affects, through which the other affects, leading to adaptation, have greatly benefited;

(*b*) The inhibition of harmful reduplicative motor reactions;

(*c*) The inhibition of psychic reduplicative memory, which has rendered possible the genesis of synthetical memory, with the advantages resulting from it;

(*d*) The compression of psychic reduplicative memory, whether it brings the effect near to the cause or results in a lapse of intelligence, to the ultimate advantage of mental development;

(*e*) The conscious utilisation of muscular reduplicative memory with the corresponding liberation of intelligence;

(*f*) The repression of such affective ideas as might thwart adaptation to the social environment ;

(*g*) The inhibition of impulsive movements, consecutive to the affective ideation, with corresponding protraction of the act of deliberation.

These are as many points marking different stages in mental evolution and which seem to plead in favour of our point of view.

But it is time to submit the new theory thus sketched to a sort of test, by examining whether or not it is in agreement with certain facts such as contemporary psychology has revealed.

We thus admit that when mnemonic elements, either reassociated already by our affects—that is, without the intervention of will—or fused in an ancient remembered concatenation, present themselves at the threshold of consciousness, there are two alternatives: the mind may push them back into the depths of the unconscious, or not.[1] In the latter case these associations must invade either the muscular system or the field of consciousness.

We may abstain from taking as a basis for the discussion the first observations in this chapter, for the data are so abundant that to examine them one by one would lead to a useless extension of this essay.

The problem of the invasion of consciousness is solved when the conscious ego voluntarily accepts syntheses of recollections due to the action of our affects. But if we get angry, for example, the inconsiderate act is already accomplished before the conscious ego becomes aware of the affective state. Such is the lot of all impulsive individuals. Their conscious self is not warned by a direct communication with their unconscious, as in intuition ; it is by *the outer perception of the effect*, produced

[1] I voluntarily abandon the first alternative, for it would lead to the consideration of mechanisms abandoned by the mind in the course of its history and proper to the unconscious only, a subject beyond the scope of this study. I am only considering here the unconscious mechanisms found in the conscious state also.

by their muscular reaction, that their reason becomes aware of their inner state.

When the normal individual is obsessed by a disagreeable recollection which he represses with all his might—that is, strives to banish from his conscious field—he often has recourse to a walk or some manual occupation, at the close of which he is calm and freed from his obsession. What has happened? The affective complex, which was not allowed to cross the threshold of consciousness, has led him away to subliminal day-dreams of which he is not aware, but the excess of mental energy has slowly spent itself by the muscular path and so the affect became susceptible to repression. It is for the same reason that, in cases of insomnia brought on by cerebral exhaustion, a walk is often followed by sleep.

In these and similar circumstances, it is not so much the amount of energy spent on subliminal ideas as the weakness of the repressive function which becomes the cause of the obsession. But in both cases the tendency to movement awakened by the subliminal affective ideation is gratified, though in an indirect fashion.

We have shown before that the repression of affective ideas is rarely directed by will; that it is, on the contrary, a function which operates spontaneously, as if our ego kept a watch at the entrance to consciousness to warn off any importunate visitor.

We now understand why certain persons speak aloud when absorbed in thought, why others gesticulate or make disordered movements: mental energy is led off by the muscular path, repression closing the passage to consciousness.

Thought always tends towards abreaction in movement even when it cannot exteriorise *via* consciousness. Napoleon, it is said, "had the habit of carving a table or the arm of an easy chair when making plans." In psychological terms, this means that the famous captain had the habit of abandoning himself to distraction, to affective ideation, as all thinkers do when drifting from the conscious state to derive the advantages we have

already described, and the thoughts which did not pass into his consciousness were externalised indirectly by his muscles. The tension accumulated before the threshold sometimes finds an outlet in the shuffling of feet, the moving of hands or fingers, or by *tics* easily to be observed around us. An audience becomes " nervous " as soon as its attention decreases for some reason or other.

I described above how the passionate are usually warned of their affective state by the external process, that is, by perceiving the effects of their movements. I cannot resist the temptation of communicating an observation of Professor Freud's, in which the same mechanism is very apparent, though in this case it is not exactly the motor system only which was set in action by subliminal ideation : " One of his patients narrated after her recovery the following occurrence : While in the street she suddenly found herself in tears, and on reflecting over the cause of her weeping the fancy became clear to her. She fancied herself in a delicate relationship with a musician famous in the city, whom she did not know. In her fancy she bore him a child (she was childless) ; later he deserted her, leaving her in poverty with the child. At this stage of the romance she burst into tears."[1]

According to public opinion in the southern part of Belgium (which a dream specialist told me was probably right), " the dreams in the course of which the sleepers speak aloud are not remembered on awakening." If this is true, it ought, it seems, to be due to the fact that integration by the external road has become impossible. But at the same time the observation confirms my theory.

A last argument which I will offer on behalf of my thesis is this : Every one will have remarked that at night, when lying in bed we try to sleep, it often happens that we awaken with a start, whereas we were already unconscious, dozing and in all probability " off for good." Analysis has shown that this sudden awakening is due partly to a reverie which has provoked a violent emotion

[1] Cf. R. A. Brill, *Psychoanalysis*, p. 244, W. B. Sanders, London. 1918. 2nd edition.

(analogous, though feebler, to that which awakens us from nightmare) and which rises to consciousness, and partly to the closing up of the access to motility. And, indeed, this awakening may be provoked in yet another fashion : If the fancy succeeds in taking the watcher of the muscular system by surprise and leads to a sudden movement, we become conscious, not because of an affect which rises to the surface, but because of the strange sensation produced by the muscular contraction. Here, again, is outer perception of the effects as heretofore. A third alternative exists, equally possible in the waking state : it is when affective ideation is repressed and allowed to sink to the depths of the unconsciousness.

In any case, the deduction from this discussion is that the conscious ego can only inhibit movements on the condition that it has knowledge either of the mnesic elements or of the affects which accompany or precede them. (This last alternative will be examined below.) It is to be noticed that this rule applies as well to ideations of an agreeable nature as to the opposite kind, or even to those of indifferent character. If I go upstairs to my study to look for an address and I come back holding an envelope without having made any attempt to carry out my initial intention, it is because on the way a recollection which has not crossed the threshold has been awakened, namely, that of a letter which I had forgotten to write, and the impulsion of my second self was not stopped by the conscious ego, first because it was not aware of the fore-conscious conception which occurred without its knowledge, and secondly because it had acquired the psychic accent.

We may equally conclude that our muscular sense is of no assistance to us when affects predominate. When our movements take place without the intervention of consciousness, we are no more warned of them than of any of the mental activities studied heretofore. Only the results attained, in each case, attract our conscious attention. There is no interest here as regards the mechanism. It is a fortunate, natural disposition,

which results from the fact that all psychism is turned towards the reaction against the non-ego.

I now believe I have established in an acceptable manner that the fore-conscious ideas which are not allowed to cross the threshold, and which repression does not succeed in sending back into the deeper layers of the unconscious, find their way to the muscular system, which is another way of saying that, for affective ideas and reduplicative recollections, the passage into motility is one alternative, whereas access into consciousness is the other. (If at this moment the reader is not yet entirely convinced, I will ask him to reserve his decision until the end of the last chapter, which I hope, will finally persuade him.) It is, I believe, to this peculiarity of mental organisation that somnambulism must be attributed. Normally the inhibition of movements is more complete in sleep than in the waking state, since the motions of affective origin are suppressed as completely as the voluntary reactions. But in conditions which we still ignore, the fore-conscious self which keeps watch over the access to motility can be taken by surprise, and then we assist at nocturnal scenes which everybody is familiar with. I do not know whether cases of somnambulism have been observed amongst animals. At any rate, I have on different occasions observed dogs, apparently dreaming, in whom the movements of the paws or of barking were not entirely suppressed.

The theory developed in the foregoing pages allows us to establish a systematic distinction between patients whose state of consciousness is troubled and who are not aware of their motor and psychic automatism, and those suffering from abulia, whose state of consciousness seems perfect, but who cannot pass from conception to act. The former have fallen back to a more primitive psychic state, for they are the playthings of their reduplicative memory, which they are unable to inhibit ; the latter, on the contrary, enjoy all advantages of consciousness save one : the connection between their consciousness and their motor system, which reminds of a defective mechanism.

This connection constitutes the second moment of the reaction, when we compare the complex "idea-impulsive movement" of the fore-conscious, to the deliberation followed by the voluntary movement proper to the conscious state.

But in the ardour of the discussion, we have not sufficiently insisted upon a point to which I would now grant all the consideration it deserves: the affective movements, which do not constitute an automatic duplicate but which might be considered as immediately adapted, may be inhibited; only this is not the exclusive privilege of the state of consciousness, for it is observable at inferior stages of mental evolution. Next to Hachet-Souplet's dog, which is unable to come to a certain point of the ring without feeling the need of leaping, or the kitten which cannot resist the attraction presented by a ball of paper tied to a string swung before its nose,[1] there are other instances of animals which retain the most absolute immobility when the wish which animates them, and which brings them to a species of consciousness, is strong enough: it will suffice to mention all those that overtake their prey by lying in wait. On the other side, we might remind the reader of the correlation between sustained attention and immobility, of which we have before emphasised the deep significance for the psychic economy. The only peculiarity I would wish to lay stress on is that this form of unconscious animal repression is still active in man, though he is not aware of it. This is, however, a mechanism which the study of the unconscious has well-established.

Everybody knows of important papers which have been saved from the fire by an intuitive arrest of the hand which was going to throw them, of persons who have been saved in the nick of time from a threatening danger by the warnings of their second self, etc. But besides such

[1] This irresistibility exists only in man in the state of a vestige. Still, the spontaneousness with which Perception awakens the wish in the child, and the simple recollection in the adult, is what repression has left of it in the human mind.

striking cases, in reality each of us continually uses the same psychic mechanism, as when, while the mind is otherwise occupied (reading the paper in the street, for instance), we spontaneously avoid the obstacles we do not consciously perceive.

I would fain return for a moment to the circumstance that all unconscious movements executed with the tacit consentment of the conscious ego or notwithstanding it, but without its knowledge, are performed at a moment of lesser resistance, when the mind is occupied elsewhere, when the degree of consciousness is at its minimum. This confirms a hypothesis already expressed, namely, that consciousness is not an indispensable condition of reacting more or less adequately towards the outer world. The importance of this conclusion will escape no one, but I must reserve my comments for the next chapter. I will only add that even in man unconscious ideation need not necessarily abreact itself by the voluntary muscles. It will be sufficient to recall the cases of the mother of the lying-in woman (page 172) and of the lady who wept in the street without knowing it. Besides, if we think of the influence exerted by our affective ideas on heart, lungs, vascular system, etc., it seems that there are great possibilities in the comparative study of the psychology of man and animal, which has received so little attention since Darwin first published his well-known book, *The Expression of Emotion in Man and in the Animals.*

I will also offer the remark that all the unconscious movements which we have analysed are the expression of wishes. We then understand all the importance attributed to them by Ribot: "*Wish marks an ascending stage of the reflex state to the voluntary state.* We understand by wish the most elementary forms of affective life, the only ones that can be produced before intelligence is born. Psychologically, they differ from the latter by the state of consciousness, often very intense, which accompanies them. *Their tendency to translate themselves into acts is immediate and irresistible,* as that of reflexes.

"In the natural state, and as long as it remains pure of

all alloy, wish tends to be immediately satisfied: that is its law, inscribed in the organism. Little children and savages show striking examples of this. With the grown-up wish is no longer in its natural state; education, habit and reflection mutilate or refrain it." [1] (My italics.)

I will add to this passage one simple remark: it is, that the wishes which in the conscious state acquire the aspect of volition differ to some extent from those of the fore-conscious. A selection has been effected among them, for only those which permit accommodation to the social *milieu* are tolerated in consciousness and made use of; the others are repressed. We thus see that if mental evolution results in a gradual perfecting, it also consists, at all stages of development, in a continual process of elimination, in the course of which mechanisms are set aside, or to which the mind confides secondary tasks, while the energy, which becomes free by the atrophy of these psychic organs, is exploited in a constructive fashion in the development of other functions present in the mental apparatus from its origin.

But at the same time this study has permitted us to see how all the psychic mechanisms which characterise the human mind are delicate and unstable, how even normal man contantly falls back into modes of reaction characteristic of animality.

These researches have also shown how much truth there is in Bergson's statement: "Life, since its origin, is the continuation of one and the same force. . . . If the essential causes working along different paths (of divergent evolution) are of a psychic nature, they must keep something in common in spite of the divergence of their effects, even as friends, separated for long years, have the same recollections of childhood. Although bifurcations occur, although lateral roads are opened up where disassociated elements develop in an independent manner, it is none the less by the primitive impulse of the whole that movement of the parts continues." [2]

[1] Cf. Th. Ribot, *Les Maladies de la Volonté*, pp. 5–6, *op. cit.*
[2] Cf. H. Bergson, *l'Evolution créatrice*, p. 57, *op. cit.*

Perhaps I may be permitted to remark that, contrary to what the eminent philosopher wrote on the same page, it is not precisely " by a series of additions which have been as many creations. . . that something has grown, that something has developed," for I believe that the unities, which along every line of development constitute the total sum, have always remained the same in number.

At the conclusion of this chapter we may summarise it with a saying of Janet : " *Penser, c'est se retenir d'agir.*" Yes, but not in every case.

CHAPTER V

CONSCIOUSNESS

Consciousness is also an animal faculty, but in a discontinuous state—It is at the opposite pole to automatism—It accompanies choice—Explanation of its discontinuous character—Criterion and definition of consciousness and of intelligence—The genesis of consciousness—Definition of will—Conscious conception—Self-consciousness.

Amongst the different psychic mechanisms which I had the intention of examining in this essay, it is the problem of consciousness which has, from the beginning, provoked my greatest apprehensions. All scientists agree that it is extremely difficult to solve, and if I reproduce below, as an epigraph, the opinion of certain authors, I do so with the intention of letting the reader judge of my perplexity. This manner of proceeding aims also at disarming a too-severe criticism: for some might think that my method of exposition is not simple enough; but they will, I hope, take into consideration that I have had to linger over preliminary questions before coming to the core of the subject. For it is my design to draw a rough sketch of the evolution of consciousness throughout mental history, so as to arrive at a definition of the phenomenon.

Ribot wrote in *Les Maladies de la Mémoire*: "We will even begin by declaring that we see no way of explaining the passage from the unconscious to the conscious. We may make ingenious and plausible hypothesis—but no more" (p. 21). It will be admitted that this opinion of the great French philosopher is not encouraging. On the other side, American scientists are no less categoric; for proof, this quotation: "Sedgwick-Minot, who tried to define consciousness scientifically in his beautiful

presidential address at the Congress of the American Association for the Advancement of Sciences at Pittsburg in 1902 (*Consciousness from a biological point of view*), arrived at this conclusion : " The problem of consciousness is at the same time the oldest in philosophy and the newest in science. The time has not yet come to give a satisfactory definition of this faculty, and we must be content with the decision of the metaphysicians, who make of the famous *cogito, ergo sum* the basis of their system. In vain have I tried to discover, either by reading or by questioning the philosophers and psychologists of my acquaintance, a more thorough analysis of consciousness." If in spite of these serious warnings my tenacity was not discouraged, it is because I believe that my former work, together with the recent data of psychoanalysis, allow us to approach the problem from a new side.

We begin by noticing that all my predecessors have established a careful distinction between consciousness and self-consciousness. This distinction is justified, for it is based on a very real difference. The first shows us the individual aware of what is happening around him ; it is the receptual consciousness of Romanes. The other, his conceptual consciousness, shows us the same individual becoming aware of what happens inside him. In both cases he uses the same implements, if we can express it thus, but the aim is different : the accent passes from the outer world to the inner ego. I at once admit, with W. James and others, that self-consciousness is but a development, a more advanced stage of consciousness, which is turned towards the non-ego. The reasons for this attitude will appear later on. At the same time, it simplifies our problem.

A second preliminary remark is the following : the English language possesses two synonymous terms, consciousness and awareness, which are, however, not equivalent. A careful distinction between the two may also facilitate further discussion. Their difference appears clearly when we use them in such expressions as the following : " I am aware of what I am going to do " and " I did it

consciously." Or still: "I am aware of my state" and "To direct one's consciousness towards one's inner state." To be aware, awareness, marks a state; "consciousness" indicates a function. For the sake of understanding the argument it is indispensable to bear this difference in mind.

We start, with Grasset, from the point of view that "the psychic functions are the same, in number and quality, in the inferior psychism as in the whole of psychism (superior comprised). Only their characters and history differ." Thus, with a great number of other psychologists and philosophers, I admit that, in circumstances to be established, the animal may equally enjoy the benefits of consciousness in all its forms. Certainly the consciousness of superior organisms seems to develop with certain cerebral mechanisms: the more the nervous system is developed, the more numerous and precise the movements between which there is choice, the more luminous also is the consciousness which accompanies them. But neither this mobility, nor this choice, nor, consequently, this consciousness need for their necessary condition the presence of a nervous system: this latter has only canalised in determined directions and carried to a higher degree of intensity a rudimentary activity vaguely diffused in the mass of organised substance.

"The more one descends the animal scale, the more the nervous centres are simplified and thus separate themselves the one from the other; finally, the nervous elements disappear altogether, drowned in the mass of a less-differentiated organism. But it is thus with all the other organs, with all anatomical elements; and it would be as absurd to refuse consciousness to the animal because it has no brain as to declare it incapable of feeding itself because it has no stomach. . . . The most humble organism is conscious in the measure in which it freely moves."[1]

Our first task, then, will be to find at what stage of mental development one must place the birth of consciousness.

[1] Cf H. Bergson, *l'Evolution créatrice*, p. 119 *et passim*, *op. cit.*

We are sure not to make a mistake if we begin by examining the behaviour of an animal, which reacts to the excitations of the outer world in a manner which all authors qualify as automatic or reflex. Thus we start, it is true, our discussion without a criterion of the conscious state (we may discover one later on). But it is generally admitted that it is easily distinguishable when an animal is in a state of consciousness, and when, on the contrary, it reacts by reflexes. Thus it is a rule to admit that animals who are lying in wait for their prey, chickens which warn their chicks when an enemy approaches, etc., are conscious, for the time being. We say they have " flashes of consciousness," because they are no longer dominated by their automatisms, because they become aware of what is happening in the outside world. In such cases, the reflexes of the animal are no longer sufficient to adapt it to the surroundings ; we have the impression that it momentarily suspends their action.

How does the cat behave when it keeps watch in the kitchen without appearing to do so ? The cook is preparing veal cutlets, while pussy purs and rubs its back along her skirts. But no sooner has she turned her back than pussy lightly jumps on the table and makes off with a piece of meat, which it comfortably devours underneath the cupboard. Who will doubt that the cat has been aware of the precise moment at which to commit the theft ? We are far from automatism here ! What may have occurred in the animals' mind ? Might it not be inferred from the circumstances that, from the moment it became aware of the meat to be filched, its wish was awakened, its reflexes had a tendency to produce themselves, but that it repressed them to choose the propitious moment ?

It seems to result from the different cases which we have examined that the flash of consciousness in the animal becomes manifest when it prepares itself for an action which breaks the monotony of its life ; that is, when it suspends the automatism of its reduplicative memory. In reality, these different observations join in a unique

operation diverse psychological moments which we will carefully analyse.

We begin by noticing that the animal seems to become conscious when habit is no longer sufficient to permit it to confront the situations brought about by its surroundings. And, indeed, if we go back to man, we remark in him also that his habitual acts are not signalled to his consciousness. He may walk without being aware of it, play the piano when his mind is absent, keep his balance on a bicycle and pedal without knowing it, etc. In other terms, when the choice between possible reactions is mechanically made, when the individual trusts to his reduplicative memory, he does not require consciousness. All authors agree in affirming that habit represents the opposite pole to consciousness. And we also have previously recognised that it appears to be the result of the least effort on the part of the mind. It is as though automatism represented a tendency to make good last, to perpetuate the adaptation to the ambiance. Only the continual, external variations oppose to this inertia, to this systematisation, and provoke the instability of the mental balance. But as the mind develops it seems to engage and sustain the strife against this variability of the non-ego. It does not submit to defeat by circumstances, and, on the contrary, makes exertions to adapt itself to them, to overcome their threat, with the aid of reactions more and more numerous as we ascend the scale of being! The necessity of surmounting them, under penalty of death, sharpens the wish for self-preservation, which, instead of abandoning the individual to happy-go-lucky but unfruitful routine, passes in review all the syntheses accumulated in memory, and so reaches, sometimes, the most unexpected results: let us think of the desperate leaps of an imprisoned animal, of the ablation of a limb, to which the fox, the crayfish, etc., proceed as a last resource. So we here establish a first point: it is that in animals consciousness seems to appear when the habitual acts no longer suffice for accommodation to the surroundings.

A second point on which I wish to lay stress is that these flashes of consciousness are observable at the moment where external circumstances visibly compel the animal to choose between several ways of reacting.

The cat will choose her own time for stealing the meat, or, if one prefers, her automatism (the act of seizing) is ready beforehand, but she waits to let it loose for a favourable moment. The beast lying in wait for its prey does not act otherwise. Animals know as well as we, but without being aware of it, which recollection will be useful for the end in view, and when it must be allowed to pass into motility.

But by discovering that choice and the state of consciousness are two simultaneous phenomena we have not yet solved our difficulty, because nothing allows us to conclude from this concordance that there is a relation of causality between them. And here the questions arise: Does the animal choose because it is conscious? or else: Is it conscious because it chooses? To the first we may answer negatively; for we know that it is not necessary to be conscious to make a choice. We thus have only the second alternative to examine. I here immediately take up the objection which would surely be raised; I have written previously that, in my opinion, intelligence originates in choice and not in consciousness, as most authors have thought up to the present. And here I seem to contradict myself, as I now admit that consciousness—or what represents it in the most primitive being capable of choice—begins with choice. But this is only an apparent contradiction and I will return to it at the right moment.

The point on which I would insist here is that, in the animal, consciousness appears at the moment of the choice and most frequently disappears again the instant the necessity of choosing has disappeared; which supports our thesis that the animal is conscious because it chooses. It is still possible to express the idea in other terms, by saying that when the surroundings impose a choice it becomes temporarily conscious. Indeed, we have often

been able to remark that the animal naturally tends to automatism, to unconsciousness, which represents the reaction requiring the least effort, and that it only represses its several reflexes under the pressure of external circumstances; so we will not return to this discussion. (The hypothesis is not complete, but we must discuss each element of it separately.)

We shall observe that this point of view coincides exactly with that of Romanes, for whom "the proof of consciousness is in the action of choosing"; only this author also has considered choice as the criterion of the mind. This is a confusion we shall try to explain later on.

But each time the ambiance compels the mind to take account of it, it forces the animal to make a new perception and a new conception, be it in the form of a new muscular co-ordination or in a purely psychic manner; in one word, it forces it to make new syntheses retained by memory. The compulsive awakening of consciousness is not without benefit to the mind as it augments its riches, the funds with which it operates. Better still, the attention which the animal is obliged to devote to the objects around it spontaneously lead it to establish new analogies between the images which enrich its memory; the outer world forces it to invention, which is no longer a function of consciousness, but a function of intelligence more or less independent of it, as we have seen previously.

We must interrupt the discussion here, because we have not yet at our disposal all the necessary elements to bring it to a conclusion. I will thus provisionally sum it up by saying that, in my opinion, the necessity of choice, imposed by everchanging, external circumstances, is present from the origin and provokes a rudiment of consciousness, which will develop parallel with the other psychic faculties. This rudiment of consciousness is a function of the greatest effort imposed on the mind; or it represents the tendency to avoid pain, to avoid non-adaptation.

We will now resume our attempts at approach from another side. We have remarked previously that, when

the animal is conscious, this state invariably presents itself at what might be called a moment of unstable equilibrium, and the flash of consciousness lasts a longer or less time in accordance with the circumstances.

At meals, my two dogs give me the impression that they are perfectly conscious; it is as if they knew that this is the moment when they will receive their share of food, each member of the family being in the habit of throwing them a piece of bread now and then. (We shall see further on why this habit has not degenerated into automatism with Cora and Bella.) They remain alert and expectant as long as the meal lasts, that is, as long as the satisfaction of their greed remains possible. On the other hand, from a dog's behaviour it becomes quite evident to the owner if it has not received its usual meal; certain dogs, even, are clever enough to make the omission manifest by gesture or attitudes which I will not describe here. I fancy these animals do not fall back into their usual apathy because their stomach is not satisfied; in fine, they are more or less conscious because adaptation is absent. In the same way, obstinate or expectant animals remain conscious as long as they inhibit their reflexes with a definite aim, which they know. They remind us of the voluntary obsessions which heighten the degree of human consciousness: for instance, my wish of observation, which renders me attentive to involuntary movements, of lapses of the tongue and other small facts of everyday psychopathology which escape others. We conclude from this that the permanence of the desire, as long as it is not satisfied, protracts and amplifies the state of consciousness. But in the above cases this permanence seems due to the displeasure brought on by non-satisfaction, the lack of gratification, which is quite in accordance with the theory I have previously sketched. Consciousness would in some way be the result of an effort of the being tending to satisfaction which automatism cannot procure.

Here is another observation confirming this hypothesis: At certain moments, for motives unknown to

me, Bella, my fox-terrier, places herself before the door, with an alert mien, and I understand by her reactions that she wishes to go out. But if after a certain time I have not opened the door for her, or no one has come in giving her the opportunity to escape, two cases may present themselves: either Bella will cry (I thus design a nasal sound which has nothing in common with barking) or else will go back to her place, in front of the fire in winter, in the sun in summer. In the latter cases she apparently abandons her intention and gives up her wish. But I have had the curiosity to follow her after I have opened the door; when she thus "cried" I saw that she invariably ran to the garden to satisfy a natural want. Therefore, I infer that the dog remembers the correction which awaits her if she dirties the carpet, and her consciousness awakens through the wish to escape the punishment: she prefers to choose the process described.

The two conditions mentioned in the foregoing chapter, when I suggested that the awakening of consciousness was the alternative of the innervation of the motor system, are here confirmed. The muscles of the dog cannot enter into action, which provokes an effect equivalent to an anticipation of pain.

But it is the other alternative which interests us most in this case; if the wish which animates the dog is not sufficiently strong she falls back into her usual apathy. The conscious state of the animal lasts only as long as she feels a violent need which is non-satisfied, as long as irresistible wishes animate her.

Simple common sense tells us that the animal is not continually agitated by wishes from its awakening to the moment of its sleep. If it is not always conscious, it is that, when its physical needs are satisfied, the exterior circumstances do not constantly excite its desires; it is not at all moments obliged to choose, because the number of excitations to which an animal is capable of reacting is limited, and more and more restrained as we descend the scale of being. It is like the distracted man who

no longer knows what he has to do, because he has forgotten the aim at which he was driving. The animal feels an interest, but for a very limited number of objects and situations. In this it resembles children, whose interest gradually extends over a greater number of objects with age, and to man, when one passes from primitive civilisation to the most refined society. At each step we thus advance in this discussion, we invariably end with the same factor of affect, which is called now desire, now effort, then interest or attention, and which we shall soon consider in their relation to one another. But we must not yet abandon the point which occupies us, namely, that of the discontinuity of animal consciousness, because I must still indicate how this discontinuity has developed into continuity in man. It is not sufficient to say that the latter has numerous interests, numerous desires, numerous possibilities of choice, in comparison with inferior psychism.

These certainly are data which will form part of the tools with which we must force consciousness to reveal its hidden procedure. At any rate, before we attempt this, there remains to be discovered the internal mechanism of awakening and also the path the mind has followed in progressing from total primitive unconsciousness to the permanent human consciousness, passing the stage where the original unconscious alternated with states of consciousness more and more frequent, more and more protracted. It is to this last task that we will at present devote our energies.

What may happen in the mind of an animal at the moment when, thanks to a change in its surroundings which puts an end to its natural indolence, it manifests such signs as permit us to conclude that it has a flash of consciousness? To give ourselves an idea of this, let us examine what happens to man in similar circumstances. Let us, for instance, take a case where the subject shows an uncommon presence of mind. The conditions of a very clear state of consciousness will be realised in this way. One day I witnessed the following scene: Two

army horses, harnessed to a two-wheeled cart (of the model used in the British army and looking like a square box hung very low), of which one is mounted by a soldier, ran away along an avenue of which the end was perpendicular to the canal. At the moment when the two wild horses reached the railing alongside the water the soldier throws himself back into the cart and thus avoids being hurled into the canal. He told me a few seconds later that the idea of this movement had suddenly come to him like a flash the moment he saw the abyss appear in front of him.

This man, apparently, had not had the time to abandon himself to introspection with the intention of observing what happened in his mind at the moment of danger. All his mental energy was concentrated upon the aim to be reached—saving his life—without any concern for what happened either in his mind or around him. Such, indeed, seems to be the very object of our conscious faculties ; to obtain the adequate reaction to the external agents. Let us examine immediately whether zoological psychology confirms this thesis ; whether the consciousness of the animal aims at adaptation, and at adaptation exclusively.

We shall not need much reasoning to convince us that this is so, for the psychic means of which the animal disposes do not leave him when he becomes again unconscious ; they only pass to the latent state, as in man when he sleeps ; they are awakened as soon as the occasion for a new reaction against the outer world arises. The psychic accent is actually born by the aim to be reached, the satisfaction of the wish, and not by the mental or muscular means to be chosen. Nobody will believe that the animal practises introspection any more than " the man in the street." Throughout the whole animal world consciousness is what W. James calls " a fighter for ends." [1]

Let us for a moment return to the example of Hachet-Souplet's cat, before its trainer had taught it to acquire

[1] Cf. W. James, *Principles of Psychology*, t. i. p. 141, *op. cit.*

the automatism of opening a certain cupboard as soon as it sees it. To provoke the action the cupboard had to contain a bait, and it is with the intention of reaching it that the cat tries to work the latch. Later on, after repeated practice, we witness the disconcerting spectacle of the animal being driven to perform the same act when it no longer procures it any advantage. But at present we know how to interpret this compulsion : the cat has become an automaton, thanks to the tendency of reduplicative memory to invade mechanically the mind or the muscles, as soon as the sensation awakens the first mental image of the series which it cannot inhibit. But if the trainer abandons the daily practice which maintains this reflex, psychic repression, as ready to act as the inverse reproductive tendency, reasserts its rights and will soon have suppressed the automatism, so that the animal will " forget " its reaction.

On the other hand, there are automatisms which never sink into oblivion ! They are those which are useful to the animal, those which serve as means to reach aims, to satisfy desires. I will choose a rather strange instance : My children have trained my fox-terrier to stand on her hind legs, with fore-feet upheld. During the period of training she has been rewarded with a lump of sugar each time she executed the movement for a sufficient lapse of time. And now Bella continues to make use of this means when she wants to obtain her share of the food, for when anyone is at table for a meal, and when all other signals by which she has manifested her desire to eat have been fruitless, she stands up against the wall and remains there until she has obtained satisfaction. The fact that the family never resist to a request presented in this touching manner has evidently contributed to make her contract this habit. But the difference between my dog and Hachet-Souplet's cat is that, with the first, the result of the acquired automatism is not likely to fall into oblivion. It is consciously that Bella applies it, for, we repeat it, she uses it only when all other signals have met with no response.

To my mind, the dog is more or less aware of her aim and of the result which will follow upon her automatism, but I admit she is not aware of what she is doing, no more than the above-mentioned filer, who files automatically, only having in view his expected end.

However, the instance of the trained cat still imparts another knowledge which I have, however, already formulated in other terms, when I have spoken of the training of animals taught to fetch and bring back an object. For it shows experimentally how the mind of a beast living free in the wilds operates: in the acquisition of any co-ordination the ultimate aim may be lost sight of, which allows the mind to detach the former from the circumstances that accompanied it at the moment of registering and to make use of it in view of a new aim to be reached. The human mind does not do otherwise without mental syntheses. On the other side, the example of the trained cat confirms our thesis, that the consciousness of the animal comes back when it tends towards an aim unreachable by a reflex act, when it unconsciously readjusts its mental and muscular synthesis in view of a result which it wants to attain. Indeed, the behaviour of the cat seems strange precisely because *it acts without aim.* But we become hardly aware of it without reflection, so true is it that we accept as quite logical all the operations performed by the mind. Man and the conscious animal only resort to expedients if they are aware of the aim, and, I repeat, in both this pursuit is generally made without their awareness. I wish to give a last proof of this:—

My son is supposed to take a certain medicine at every meal. But he very often forgets it. The chances of inspiration have brought it about that I should put this neglect of the boy into parallel with the eagerness of the fox-terrier, who never fails to perform the rite of standing upright to get a part of the meal. If the boy forgets to take his medicine it must be that he is not quite aware of the ultimate result; Bella, on the contrary, always remembers her particular means because she is conscious of the result she wishes to obtain. Here, as in the phantasy

analysed in the third chapter, the wish to reach an aim is the revivificator of recollection.

I provisionally close this part of the discussion with the words of Bergson: "In the action, it is the result which interests us; the means import little provided the aim be obtained. From this it follows that we tend entirely towards the aim to be realised, trusting to it for the idea to become act. And from this it also follows that the point where our activity will rest is above all represented explicitly to our mind: the movements constituting the action itself either escape our awareness or only reach it indistinctly."[1]

Now that we have established that consciousness is a state in which the animal tends to react towards its surroundings to which it is not adapted—which is to say that inadaptation favours the evolution of consciousness—we have increased our instruments of research by a new unit and we may widen our horizon a little. I will start by reminding the reader that in the whole of the first part of this work I have insisted on the utilitarian character of our perceptions. We identify all our sensations of objects with the aid of syntheses conserved in memory, thanks to their causal relations. At present we understand the motive of this characteristic orientation; without being aware of it, our attention for the exterior world is always directed towards the aim to be attained: adaptation. This is the tendency which characterises the mind throughout the whole of the animal series, and when man in the conscious state perceives things from the point of view of the use he might make of them—a preoccupation which never leaves him—he only follows a route which has been traced by all beings who have preceded him since the origin of life. It is this tendency which has led most of the psychologists to conceive of consciousness as only a cognitive function, thus mistaking the means for the end. For the coming into contact with the non-ego is but a preparatory phase to the reaction the mind prepares and the motor system executes.

[1] Cf. H. Bergson, *l'Evolution créatrice*, p. 323, *op. cit.*

At this point a long discussion will not be necessary to prove that the discontinuity of animal consciousness has become continuity in man: the author or the inventor who works twelve hours a day, lives with more consciousness than the *lazarone*, who passes the greater part of the day dreaming in the shade, or the dog who becomes only animated at certain moments; for the former pursues a design with such an excitement that it will only leave him in peace when the solution is reached.

On the other hand, after the analysis of the fancy of the flea, which has allowed us to follow the mental synthesis in action below the threshold of consciousness, the reader will be able to conceive what the unconscious representation of the aim in the animal must be like. For all our phantasies tend towards an end which anyone can discover, and they are inspired by the same tendency to adaptation which manifests itself in the form of will, when we are conscious.

The discussion we have suspended for a moment gives me also the opportunity to remark how those psychologists, who distinguished between awareness of the outer world and awareness of the self, were right. Primitive consciousness is above all directed toward objects capable of constituting a menace for existence.

I must now open a parenthesis, to avoid which I have cut off from the above quotation of Bergson a sentence which preceded it and which is of great importance. This avowal will permit me at the same time to pick up again the thread of a discussion I have been forced to abandon previously, because at that moment we had not yet at our disposal all the necessary elements to bring it to an end.

The sentence I have voluntarily omitted is the following: "The rôle of *intelligence* is indeed to preside over actions, and, in action, it is the result, etc. . . ." The reason for this omission is that I do not share Bergson's opinion, for I think it is rather the rôle of *consciousness* to preside over actions. I will explain: I suppose, as said before, that intelligence begins with the first choice; I have

also added that the first choice is accompanied by what must become consciousness in the course of evolution. At the origin conscience and intelligence coincide, just as the first choice marks the date of the first synthesis, of the first perception, of the first conception. This hypothesis thus realises the conditions laid down by W. James: "If evolution has happened without hitches, consciousness in some form must have been present at the origin of life."

But, at the last stage of evolution, intelligence and consciousness no longer cover each other entirely. We have analysed in the course of these pages many intellections in the elaboration of which clear consciousness has taken no part. Amongst these ideations, which we have called pre-conscious, we have even met with products which everybody agrees to classify as superior products of the mind—this without prejudging the relative value of my inspirations. Is it not evident, since then, that between consciousness and intelligence there is a marked difference?

But there is more: if my analyses are not erroneous, amongst all the syntheses elaborated by the fore-conscious ego precisely those which are called "inventions," those which lead to the discovery of new relations between things, are the only ones which do not directly aim at the reaction against the outer world.

This is the reason why I have used the terms of Bergson in a sense a little different from the intention of the author. *Intelligence is a more general term than consciousness.* It comprises the ideations preparing the reactions towards the ambiance, those which are called conscious, and the intellections which do not tend towards thither, and of which we are only exceptionally warned by the channel of intuition. In the same way, our motor system produces movements which not only are not favourable to adaptation but which, on the contrary, render it impossible.

I shall be allowed to remark that, in the course of this exposition, I have not for a moment abandoned the domain of normal psychology. Indeed, human unconsciousness, from which I have only drawn inasmuch as this discussion

made it necessary, is also the seat of ideations following more primitive modes, on which I have avoided laying any stress so as not to obstruct our path with cumbersome obstacles: These intellections are provoked by desires analogous to those provoked by natural dreams, day-phantasies and inspirations, but they are wishes not avowed, animal desires which we carefully ward off from the gate of our consciousness. In short, they are those mental operations which are the object of study of pathological psychoanalysis. And I mention them here only because I had to invoke these inferior products of our psychic organ to sustain the point of view that the activity of intelligence does not consist uniquely in operations leading to practical result. Such is exclusively the rôle of consciousness, which only disposes of a part of the psychic mechanisms. I at once add that they are the most perfected, except for the mechanism of originality.

This digression will not have been without advantage for our ultimate end, as it has furnished us with a criterion of consciousness. *All operations in which the mind takes part and which are such as to lead to a new adaptation to the surroundings are capable of becoming conscious. Such operations are pursued under the direction of the vital impulse, wish or will, following the evolutionary stages.*

This definition, however, calls for some comments. First of all, it includes that adaptation can be pursued with man beneath as well as above the threshold of consciousness. But, at the same time, it also applies to the psychic reactions of the most primitive being.

I have chosen the expression " is capable of," because in man the mental syntheses which unite the indicated conditions may still not be admitted into consciousness, because he may refuse access to them, thanks to the mechanism of repression which we have examined in the previous chapter. This is what happens at the moment of going to sleep, for instance, and at other moments which we cannot stop to consider here.

The adjective " new " is used with the idea that it also includes the sense of " renewed " adaptation, is considered

as new all accommodation which did not exist a moment before, for which the mind has had to proceed to a new choice. But the term "new adaptation" has a wider meaning still, for it implies that the instinctive reactions of the insect, for example, cannot become conscious. Its hereditary reduplicative memory prevents it from adaptation to circumstances which instinct has not foreseen. An analogous reasoning applies to the characteristic intellections of hysteria, of neuroses and psychoses.

I must also recall that up to the present it is above all the *state* of consciousness which we have examined. But we shall soon concentrate our efforts upon the functional aspect of consciousness.

Finally, I will observe that after this argument the unconscious appears under a double aspect: the unconscious is the zone where, by hypothesis, the recollections are preserved in the latent state; it is also the seat of the psychic mechanisms which we have reviewed in the course of the previous chapters, and of others still to which we have made vague allusions.

Though this part of the argument is not yet terminated, I will no longer delay presenting a *definition of consciousness: it is that part of intelligence which is organised for the reaction against the outer world, for the adaptation to the non-ego.*

This definition includes the statement that *intelligence consists in the whole of the psychic operations, which in their turn consist in reviving certain recollections under the stress of wish or will most often to reassociate them—and to repress others which are not useful to the end in view.*

In their turn *wish and will should be defined as aspects in different degrees of the vital impulse tending towards adaptation.*

These definitions clearly establish my point of view: intelligence is the result of an evolution in the course of which certain primitive psychic mechanisms (we have studied some of these previously, but not all) have been abandoned, but of which traces still exist, reminding us of the pineal gland, vestige of a third eye, the vermiform

appendix of the cœcum, the remains of the third eyelid, the coccyx, etc.

Amongst intellections, all do not lead towards adaptation : the psychic apparatus represses as much as possible all those which counteract it. But this repression is far from being perfect.

On the other side, all the wishes which do not aim directly at setting in movement the motor system for reaction against the surroundings do not need to borrow the paths used by intelligence at the conscious state, though they may be the most perfectioned from the point of view of ultimate accommodation. (Those which lead to inspiration and to day-dreaming, for instance.) It does not matter if they make use of primitive mechanisms condemned for conscious use ; as long as they do not aim at a sudden flash of action they can follow any capricious meanderings and take their own time. It is thus we must interpret the original syntheses which we have analysed and which constitute the essence of inspiration. The latter is never realised by the procedures of consciousness. The same reasoning applies to our day- and night-dreams. They are the manifestations of wishes which do not reach consciousness, either because the mind has temporarily given up immediate accommodation (as in the fancy of the flea and the " dreams of convenience ") or else because the wish which provokes them is one of those which the conscious ego represses as being harmful to adaptation (wishes, criminal to-day, but useful or tolerated in primitive life). For, while the conscious ego gives proof of much eclecticism, the unconscious ego flinches before nothing.

I will also underline the fact that, since usual language proclaims the perfect identity between the terms " intelligence " and " psychic organ," this definition of Freud's [1] is a confirmation of the above one : " Consciousness is a sensory organ, for the observation of objective excitations and certain psychic qualities." Though the last member of this definition will only acquire its full signifi-

[1] Cf. S. FREUD, *The Interpretation of Dreams*, p. 484, *op. cit.*

cance after the discussion which I reserve for the second half of this chapter, we may, from the present, recognise that between Freud's conception and mine there is no difference.

Both definitions contain the same elements : only the point of view differs. Freud's starting-point has been the study of the unconscious, especially as manifested in dreams. That is to say, also, that he has had to vanquish difficulties deemed insurmountable not long ago, whereas those I have met, departing from the study of the conscious psychic phenomena, have been removed to a great extent by the data contained in the psychoanalytical literature which I have had at my disposition.

I take advantage of this parenthesis for recognising that in the course of the preceding pages I have not been able to do full justice to Professor Freud's findings, which I have continually put to advantage without seeing my way to quote him. And it is only fair to recognise my indebtedness to him by stating that his above definition has contributed the landmark which has ceaselessly guided me in my search for the solution which I proffer in this book.

Coming back to the conclusion that consciousness is but a particular aspect of the superior mental mechanisms, which Freud calls a sensitive organ, we remark that the two expressions designate the same part of intelligence utilised for adaptation. On the other side, I cannot abstain from recalling to mind, although I anticipate more or less, that the psychic qualities of Freud are but another name for the results to which the psychic mechanisms lead in the recall of synthetical and duplicative recollections, and which we will have to consider again later on : they are designated as feelings of assurance, of certitude, etc.

After this protracted but necessary halt for co-ordinating the results of our researches, we take up again the comparison between the animal, at his conscious moments, and man, and we shall try to find the answer to this last question : Which is the internal factor which provokes

the awakening of consciousness? The answer is ready at hand. Still we will begin by filing up some precise facts.

(1) Bergson remarks with much reason that consciousness comes back when exterior conditions stop the unconscious movements executed by a being. We admit that it is the displeasure of non-adaptation which causes the return to consciousness.

(2) When my dogs find out that I am preparing to go out, they immediately awake from their dullness and manifest in the most evident fashion that they wish to accompany me. They become conscious because their reduplicative memory awakens a desire of an agreeable nature, which they expect will receive satisfaction.

(3) The only flashes of consciousness observed in insects present themselves when they are confronted by some unexpected obstacle which they recognise, but sometimes only after a relatively long lapse of time. This flash of consciousness coincides with the moment of choice, and we may suppose also the simultaneous presence of a disagreeable effect.

(4) Hachet-Souplet's trained dog refuses his leap when there is an obstacle in the ring; therefore he must be more or less conscious. He represents the inverse case of my dogs.

(5) If we are sitting in front of the fire, absorbed in day-dreaming, we become conscious as soon as we burn our hand. Pain awakens the tendency to self-preservation, though we perceive the physical pain and not the wish to accommodate to external circumstances.

(6) When we receive an inspiration, the intuition, the interior joy of discovery, leads us back to the conscious state.

(7) It is my desire of observation which makes me conscious of each *lapsus linguæ* I commit, of all mechanical movement which I perform, of a lot of small errors due to the defective functioning of my psychic apparatus; and in the same way I become conscious of the psychological errors of others.

This is a queer assemblage, it would appear, and yet from the psychic point of view all these observations present a common element. Each instance is accompanied by the awakening of an affect to be classified in the category either of pleasure or of pain, as I have indicated. In each case, we might still say, there is either an obstacle to or a spontaneous tendency to adaptation. In the first five the cause of the awakening of the affect can be found back in the surroundings ; in the two last the cause is internal. It is, moreover, thanks to the latter that we are able to interpret the others with the certitude of not being mistaken. During the phenomenon of intuition each of us may himself assist at the awakening of his consciousness by his affects. But as the mind systematically ignores and represses all that which in our inner self is liable to cause displeasure, an instant of reflection is necessary before admitting that it is still the same affect, painfully tinted, which awakens what we mean by conscience in the theological sense. For the same motives we may conclude that the affect, provoked in the animal by external or internal causes, awakens his consciousness. But he is no more aware of it than the man, whose mind is wool-gathering, is aware of his feelings. The affect is thus the factor which puts the mechanism of consciousness on the move.

We may here recall our former conclusions : when this affect, which leads to conception (unconscious with the animal, fore-conscious or conscious with man), follows its natural course, it is manifested externally by a motor reaction unless an obstacle arises on the way. In normal man this obstacle may arise in the form of repression, the mechanism which counterbalances the effects of affective ideation. But throughout the zoological scale this inhibition provokes consciousness each time the repressed motion tends to an accommodation to the outer world.

This remark gives us the occasion of offering another : the affects which enjoy the privilege of awakening consciousness are exclusively those tolerated into the

conscious field. The rejected feelings, the primitive animal affects, can but provoke the activity of the mental mechanisms on which consciousness exerts no control and which it is content to maintain beneath the threshold. But hysteria and neurosis teach us that in unfavourable circumstances this unconscious ideation may equally be prolonged into motility, but by indirect paths only, never by those held under control by consciousness.

At last we here find a confirmation of a hypothesis taken over from Ribot and which I have developed in the preceding chapter, namely, that the awakening of consciousness constitutes the alternative of the passage of the idea into motility. We here find how this process operates and we now understand why the development of the mechanisms of consciousness keeps pace with the repression of automatic movements. This is a procedure caused at its origin, as all others, by outer circumstances, and of which the initiative has afterwards passed on to the ego. From that moment onwards, we observe in the zoological series an increase of conscious moments with a corresponding reduction of motor automatism.

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We now dispose of sufficient data to undertake a short sketch of the transformations which the psychic mechanisms have had to undergo for allowing the mind to pass from the fugacious consciousness of the animal to the state of permanent consciousness of man.

In the course of the inquiry we will especially occupy ourselves with consciousness considered as a psychic organ turned towards the outer world, and we shall have to consider three essential factors : the ambiance, memory, which is its psychic representation, and the wish, which constitutes the exciting agent of the new syntheses. It will not always be possible to examine them strictly apart, because in reality they are narrowly connected with each other, but every time circumstances will allow we will consider these three elements separately.

We begin by observing that if the automatism of

inferior organisms presupposes the immutability of external conditions, according to Ribot *consciousness only exists under the condition of a perpetual change;* it is essentially discontinuous. A homogeneous and continuous consciousness is an impossibility. Or, to use the terms of Hachet-Souplet, "whereas *human reason is a series of conscious states,* following each other nearly without interruption in time, that of the animal is constituted by momentary conscious states. This degree of frequency determines the more or less developed intelligence of the individual under examination."

"As soon as consciousness awakens the sentiment always has an object." This is to say that with man the desires are multiple and so abundant that there are but few moments in the course of a day when sensations of objects come to him without immediately arousing a corresponding wish, which puts the psychic mechanisms on the move. (It is not necessary that he be aware of this wish to adaptation.) But all the affects in general have undergone, in man, a deep modification, in this sense, that although much more varied in number, this multiplicity is the result of subdivision and not of addition. All the wishes opposing to adaptation have been repressed and driven back across the threshold, so that the number of primary affects has been reduced. But those which repression has spared, the ones useful from the point of view of accommodation, have been developed, have shot forth abundant ramifications, and have ended by unfolding such a full-grown crown that there is hardly any exterior excitation which does not immediately bring about a corresponding quivering in some part of the psychic organ.

As has been proved long since, all satisfaction creates new needs, and biology shows that life in common has contributed not a little to domesticate our affects, to expand, refine and reinforce the more useful ones. To the motives of repression which have been exposed previously, and which only aimed at the survival of the individual faced by hostile nature, collective life has

added others to which every form of progress adds more. These are the psychic inhibitions which result from life in society, and of which one of the most modern and most general forms has taken the name of tolerance, although it was first the respect of the fellow-creature's life. But with the development of primitive society, this respect, which in psychological terms means the repression of wishes and their abreaction in motility, has extended to the offspring of the other members of the society, to the products of their hunting, to their wives, etc., finally to become a code of prohibitions which we have to teach to our children, for they often do not understand the logic which has edified them. We might have expressed the same thing more briefly by saying that the volition of the standardised human individual comprises no tendency which opposes to the adaptation to society; but we should, perhaps, not have been so easily understood. But it is obvious that to this repression on the part of one category of individuals corresponds the satisfaction of the wishes of the other members of the community, who are thus allowed to constantly develop new needs, in the same ratio as the inhibition, imposed on themselves by the former, enables the latter to reach the coveted results. There is a powerful factor of development which it would be difficult to under-estimate, but which we cannot comment upon here. Anyhow, we must also remark that psychic evolution at all stages seems to result from the greater individual effort, which has succeeded in inhibiting the modes of reacting resulting from the least effort and substituted a more difficult performance, conceived by a new synthesis. This substitution is obtained thanks to an active recourse to memory in its synthetical and reduplicative forms, thanks to a new choice instead of a passive submission to reduplicative recollections awakened by outer excitation. The mechanism of repression thus constitutes a very curious phenomenon, because it is the realisation of the fact that the wish has been able to vanquish the wish, has forged arms to conquer itself. It constitutes the victory

of the ego over the impulses awakened by the non-ego.

Still, as long as man has not taken over the rôle of the surroundings which impose new adaptations, as along as, inverting the rôles, he does not consciously adapt the surroundings to his needs, the choice has been exclusively imposed by the outside, incontestably. However, this contact has not been fruitless, for the living being is not only capable of submitting to events, it may also anticipate them, and we affirm that each anticipation has enriched his mind with a new synthesis, as we have remarked previously.

So that memory and wish, the two essential factors of intelligence in general and of consciousness in particular, have developed simultaneously and have become alternately cause and effect under the rule of the non-ego, the latter losing its supremacy in proportion as the mind has progressed.

All this discussion tends in reality to establish that wishes, whose essential rôle it is to awaken memory and to provoke synthesis, have become more and more numerous with the progress of mental evolution. But man, who has no awareness of all the wishes dormant in the depths of his mind, more often talks of will than of wishes, perhaps because he satisfies them so easily. For us *will is constituted by all the wishes of man tending towards adaptation* and which we only awaken one at the time.

To sustain our conception we dispose of several arguments: (1) Will is the expression of a multiplicity of which we have just followed the genesis. (2) The term "volition" expresses the fact that any wish whatever may be maintained in the active state during an undetermined time, a stability of which we have mentioned examples in the animal world, namely, with animals who watch their prey, which are obstinate, etc. (3) Volition implies a sentiment of certitude wanting in desire, and which we will submit to discussion later on. All that the necessities of this exposition permit us to say of it, at present, is that the difference between wish and will

resides especially in the peculiarity that we prefer to use the verb " I will," when the satisfaction to be obtained seems more or less certain, while we prefer the use of " I wish " for cases when the attainment of the result leaves certain doubts. We shall see later on that this difference is reducible to a resort to expedients. The child becomes more and more voluntary with the increase of the number of his means to satisfy his desires. (4) Our fourth and last argument is the following : If it is quite true, as Ribot writes, that " to will is to choose for enacting," choice also implies the mechanism of repression, that is, that will puts in servitude, *hors-de-combat*, certain psychic elements to which we shall not come back any more. It is the other side of the medal which ancient psychology has not sufficiently examined, with the result that it has prevented it from elucidating the problem of which a solution is here offered.

However it be, human consciousness appears to us a volition freely disposing of memory in its most absolute sense. The will is for us an amalgamation of wishes all tending towards a unique end and which may be reduced in last analysis to a unique primary wish. In other terms, *will constitutes the permanent activity of the wish for adaptation.* Memory, not susceptible of becoming conscious on its side, is an amalgamation constituted of mnesic films registering all the experiences of the individual and of all the syntheses elaborated between their different elements, as well unconsciously as consciously, but for as much only as they are all directed towards the same aim towards which tend all wishes susceptible of becoming conscious. In last analysis, the state of consciousness is function of the memory and of will, while intelligence is function of memory and wish. And we repeat on this occasion that will is only a specialised form of wish, which is a more general term.

But there is yet an aspect of affect which we have not laid stress upon sufficiently. I have written previously that things presented themselves, as though, by passing into the service of consciousness, the affect primitively

impetuous and brusque had lost a part of its expansibility. Perhaps we may here indicate one of the reasons of this transformation. What we call affect in psychology corresponds to the " energy " of psychics, and the analogy with electrical energy will furnish a means to express my idea. If the affect be a psychic current, we may continue the metaphor by saying that the wish is the source of it. But, as the fundamental tendencies of the human mind (of which the principal is the wish of self-preservation) are rather easily satisfied in our modern societies, the ambient circumstances rarely oblige the mind to call up all the resources of its energy. Moreover, repression plays the rôle of a regulating agent, so that everything contributes to favour the permanent adaptation of the individual, without abruptness and without maximal expenditure of psychic energy. In other terms, the surroundings are less absorbing and the individual less passionate when he has reached the stage of continued consciousness, which allows him to perceive delicate shades in the conditions of the outer world. The whole of psychic evolution points towards the subjection of affects and the use of their energy for more and more complex practical aims.

However, this expenditure is more considerable than the conscious result would lead us to suppose, for the latter does not show the amount of the energy which is neutralised by repression, although it is nevertheless spent.

We may now turn our attention to the other factor of consciousness and try to set off what distinguishes memory under the influence of will from what it appears under the influence of wish. But I must first open a parenthesis. I do not speak of conscious and fore-conscious memory, for memory is always unconscious, or better still: at the latent state, it retains objective and subjective impressions without appearing to, and is revived partially under the stimulation of the psychic current which is used upon it when and where it is wanted. To treat of conscious memory is, in my opinion, a mistake, for the particular aspect of the faculty of retention, so designated, is never

entirely revived. On the contrary, we can only reanimate an infinitely small part of its contents at a time, and during that period all the rest remains in the latent state. Shall we still talk of conscious memory at the moment when the mind gives up the attempt to revive the only complex which we can recall at a time in the waking state, and which varies from one moment to another. He who would persist in such a use would then simply designate by "conscious memory" the little particle of its contents which we successively awaken for our current needs, which is not at all conformable to the meaning usually given to those two words.

For these reasons I will simply speak of conscious *recollection*, designating by that a recollection evoked with awareness or by consciousness, that is, by our mental organ at the moment where it voluntarily reacts or prepares to react towards the outer world. By fore-conscious and unconscious recollection we mean, on the contrary, a recollection awakened by the fore-conscious and the unconscious ego respectively, that is, by the psychic apparatus at a moment when voluntary communication with the non-ego is suspended.

In other words, I oppose the terms conscious, fore-conscious, unconscious (three phases of the ego, distinguished for the facility of study) to the latency of memory. I am well aware that we might argue whether latency and unconsciousness are not the same thing, but it is a problem which we do not try to solve at the moment when we concentrate all our efforts on that of consciousness. But what we may admit without discussion is that each unit of this trinity disposes of proper mnemonic syntheses and mechanisms. This is, moreover, a fact which results from our two first chapters and to which I mean to come back presently.

Having thus prepared our ground, I will observe that after all the permanence of wish, which we have called will, only results from the fact that several affects follow each other unceasingly, so as to maintain the contact with the exterior as long as the state of consciousness

lasts, and that it is from this uninterrupted succession especially that our impression of continued alertness results. The principal difference between our state of consciousness and that of a dog's, for instance, at the moment where he follows our every movement with an intelligent look, is that our interest for the surroundings never disappears. It is this continuity, sustained by the impression of certitude mentioned above, which also constitutes the principal distinction between wish and will.

I wish at present to establish that a succession of recollections, similar and parallel to the former succession, surges up in the mind, which constitutes the second condition to maintain the state of consciousness. I will try to prove at the same time that the third condition is realised by the impression of certitude about the fore-conscious judgment, an impression which already accompanies the most unconscious synthesis at the origin, but has slowly developed, to reach at the conscious level a more accentuated degree than during fore-conscious intellection. It is, indeed, this feeling of certitude (or of doubt, if we consider the negative side) which gives to the conscious state the distinctive character recognised by the vulgar, but it is also the only one it recognises. We call it *awareness*. We will sustain later that it is on the synonymy between the state of consciousness and the state of certitude that Descartes has based his philosophical system : *cogito, ergo sum*. But in proceeding in this manner he has constructed it on only one of the elements constitutive of consciousness.

As our previous discussions have taught us that the phenomena of perception and conception are only two different aspects of the faculty of the reassociation of mnemonic elements, and that, on the other side, we know that mental life is constituted by perceptions and conceptions which succeed each other unceasingly (that is, which lay memory under contribution in a perpetual fashion, from birth to death), our first problem is reduced to proving in what our conscious perceptions and conceptions differ from those of which we get no warning.

If I succeed in explaining from where proceeds the notion of self we have at the conscious state, I shall have reached my aim. To arrive there, let us begin by examining in what conscious perception differs from a fore-conscious one.

The reader will remember that we have qualified as fore-conscious the perception of the electric spark we have so long studied. Why have we called it fore-conscious? It will be easier to answer this question now than if we had tried to at the moment of its analysis. This perception is fore-conscious because at the moment where it has been realised the mind was not tending towards adaptation to the outer world. I remember that I was walking up and down on a platform in the station, lost in thought. I may argue that my consciousness limited itself to this: to lead my steps in such a way that I did not risk being crushed by an oncoming train which might happen to pass on either side of the platform; the excitations coming from further, from other sources, did not interest it any longer. I was in a state comparable to the indolence of my dog, when he stretches himself out next to my desk, without his surroundings seeming to interest him. I may thus state that what characterised my state of fore-conscious at that moment was the almost complete absence of will; I was momentarily adapted, my consciousness slowly flickered out. But we have seen previously that in the absence of the conscious ego our second self takes over a part of its functions. "Take over" is perhaps not the exact term. It would be better to say that our second self always looks after our security, in collaboration with the conscious ego, only we can but observe its influence at moments when, because of the drowsiness of will, it remains alone to watch over us (as is also the case in dreams of convenience).

And how does our second self operate? Amongst the innumerable objects which surround me on all sides, and whose excitations attain all my sensitive organs of the periphery, a single one succeeds in putting on the move the psychic mechanisms of which the fore-conscious disposes. One single excitation will be identified, thanks

to a hazard which I will not even try to explain : the electric spark.

I will immediately point out that if I had been conscious, if will had presided at the operation, if the wish for adaptation had been vivid, the sensation would have been recognised instantly, with lightning rapidity, for my conscious ego would not have failed to remark all the accompanying details, amongst them the cabin over the lift. Moreover, the latter was visible through the glass panes. But, we have already seen it, the mental mechanisms so adequate, so perfected, which consciousness monopolises, are not at the disposal of the second ego, and the latter only remarks the spark, which is thus isolated from its natural ambiance. It is in the same circumstances as the patients who manifest a narrowing of the visual field.

We may still make another comparison : my foreconscious ego perceiving only the spark and no other stimulation, reminds me of the passionate man who does not listen to arguments, but only catches one single word, such as corresponds to his effective complex ; or of simple folks, who at the theatre cannot follow the action, and in presence of a dramatic situation only see its comical side and laugh where others would weep ; or of the animal which, in a series of events, only reacts towards the familiar object that has the gift of awakening its consciousness, which explains its sudden and unexpected intervention. Nothing would be easier than to continue the series of analogies ; but these will suffice to show on which common element all these comparisons repose ; what the hysteric patient, the passionate, the simple-minded, the animal *cannot* understand, the conscious ego does not *try to*, perhaps *will not* understand. Amongst the beings, which we have put on a line, some do not understand because their memory is not rich enough, the others because it does not operate as is required for adaptation. It is thus a question of memory, or rather of mechanisms of recall, which is at stake.

The contact with reality thus is subordinate to a certain manner of working of memory: this is the first conclusion we draw.

We might express this otherwise: as the sensation of the spark provokes mental activity, the conscious ego disposes of mechanisms which awake in memory a whole anterior synthesis, a complex recollection in which the mnemonic image of a spark is related to that of a lift. The mind controls, by a glance directed towards the object of the sensation, if reality corresponds with the evoked recollection and concludes: it is a lift which has provoked the spark. Or else: conscious sensation comprises more exterior elements than the fore-conscious sensation. But whatever be the preferred interpretation, it invariably amounts to a superior synthesis which is awakened in memory, synthesis of which the pre-conscious ego cannot dispose.

We knew beforehand that the problem of the difference between the conscious and fore-conscious states would be brought back to a question of wish and of memory, but previously we have had to content ourselves with the description of these affects and mechanisms; at present we overtake them during their combined activity in presence of the non-ego.

I thus repeat that the renunciation to adaptation, the drowsiness of the will, brings about the simultaneous fainting away of the psychic mechanisms, which revive recollections and associate them and which constitute endowments characteristic of the conscious ego only. We had already previously witnessed the awakening of consciousness through the influence of an affect; here we are in presence of the opposite phenomenon: the lapse of consciousness following upon the renunciation to an affect. But we are too much used to these alternate passages from one state of consciousness to another to be able to notice the changes exactly, as we only become aware of the effort of the masticating muscles when the articulation of the under-jaw is out of joint. In the same way, pathological cases are needed to put us on the road

to the psychic phenomena, which, however, constitute normality.

But let us continue to observe what happens in the mind during the perception of the spark. Recollections are successively awakened in memory until at last the adequate image is revivified and the exterior object identified. We have previously seen that this awakening is caused by a wish, which is still the expression of the tendency to adaptation. But it is no longer conscious will which has entered into action, it is replaced by a less intense wish of which I am not aware. This simply proves that the tendency to accommodation is so primary that even the absence of will cannot entirely suppress it. It was not unnecessary to remark it in the course of this discussion, as the sequel will prove.

However, how slow this wish is in its operations, and how awkward! It would have been sufficient to take the cabin into account for sparing so much pains, so many unfruitful researches in synthetical memory, to discover a similar image of an object able to provoke a spark, then to go back, as we have seen, to reduplicative memory, to judge if the object corresponds to the conditions of the sensation.

Let us now examine if I have been right in supposing that the cause of this slowness must be attributed to the fact that the fore-conscious ego, or the wish which is its expression, has not had at its disposal the psychic mechanisms proper to the conscious ego. For this hypothesis to be confirmed, the mechanisms of recall will also have to make use of our two forms of memory, as in fore-conscious perception, and this usage must lead to a more rapid identification. A short analysis of a conscious perception will make the matter plain.

I am walking along an avenue. I see a schoolboy trying to jump on the footstep of a moving street-car. Instantly the top half of my body sketches a movement of drawing back and my progress is stopped for the fraction of a second. What has happened in my mind? The sensation produced on the retina by the car has

reanimated in memory by the synthetical road the corresponding mnesic image.[1]

But at the same moment I have estimated the danger run by the imprudent boy: my *reduplicative memory*, which, compressed, approaches affect to cause, *has shown me in the fraction of a second the possible consequence.* By an induction, comparable to those we have discerned at the origin of unconscious movements, my tendency for self-preservation (a form of adaptation) has awakened, and the recollection scarcely missed to pass into the motor-system, at the entrance of which repression just stopped it in time, but not quickly enough, however, to prevent me producing the above movement.

How far we are here from the slowness of the perception and the narrowing of the visual field! And yet the elements constitutive of the psychic operation are exactly similar, but how much more rapid and, let us say the word, more perfected their manipulation. To perceive is, after all, to recognise, thanks to memory.[2] And each time we perceive less, it is due to memory, which works defectively. (The case of organic inferiority is excluded.) The narrowing of the sensorial field is due to the fact that the mnemonic complex, the corresponding memorial synthesis, has not been sufficiently well revived. In normal man at the fore-conscious state, this diminution has to be attributed to the lack of interest for the surroundings.

But the aim I want to reach urges me to examine one more element of the problem. We have seen up to the

[1] Of this recourse to memory we can easily persuade ourselves, if we try to recognise an object far-off. For then we often express this operation verbally by making all sorts of suppositions as to the nature of the object: We may notice an object in the sea: Is it a sail, a bird, a lightship, the funnel of a steamer? etc.

[2] The analysis of the mechanism of perception, of the conscious synthesis which we have just made, permits us to decompose the mental operations which RIBOT thus alludes to in his *Evolution of General Ideas*: "In consciousness a sign recovers *a potential knowledge* which may be brought back to consciousness and from which it takes all its value." In reality, the "sign" brings back to the internal glance a whole synthesis, but we are not aware of it.

present that the conscious and fore-conscious operations both contribute an affect which directs the operations: here will, there wish. In each case recourse is had to memory, by the road of synthesis first; but our previous discussions have taught us that the conscious syntheses are more logical, more perfect than those which form part of the system built up by the fore-conscious ego. The process is continued on both sides by a recourse to reduplicative memory following a procedure which here shortens and there lengthens it. At last, a tendency to movement (if necessary) is repressed with or without success. But the speed of the process at the conscious state has prevented us from noticing that the choice, which the affect has made in memory, is accompanied by a judgment which ascertains the conformity between the sensation and the mnesic image. This choice, which we have easily been able to follow in our former analyses, is yet the same in both cases, but it seems far quicker here, and thus awakens the suspicion of another improvement which this mechanism may have undergone under the impulse of consciousness. The conscious ego seems less hesitating than the fore-conscious in its recourse to memory, will is surer of its fact than wish, as we said previously, and observation proves that this hypothesis is correct. But the comparison between the fore-conscious and conscious perceptions which we pursue here allows the inference that there must be a high correlation between the certitude and hesitation on one part; a strong will or a feeble wish on the other part; and a quick and slow recollection on the third part.

The real question is to know the motive of this correlation. I declare, without long preamble, a concision justified by our former developments, that in my opinion the certitude is the function of the action of the affect on memory. Indeed, we may be sure of a thing, whereas memory temporarily refuses to disclose the very element relative to it. The certitude thus augments with the directness of the affect and its canalisation towards adaptation. We may, at present, recognise that this

certitude, this impression of being persuaded, corresponds to an analogous subjective factor in animals: my dog seems quite certain that I am going out when I take my hat from the hall-stand; he is still more so at the sight of his collar, of which the apparition, at this precise moment, is the certain token that he will be allowed to accompany me.

It may be useful to recall here that the advantages attached to conscious perception are the results of a gradual evolution, in the course of which the mind has had to conquer its own inertia, which prompts it to reproduce always the same synthesis quite ready in memory and to inhibit the tendency to spontaneous movement. It has had to impose silence to its wishes leading to non-conformity and to mitigate those useful to adaptation, so that the inopportune excitations should no longer distract it from its useful psychic operations. But while it subdued its reduplicative memory, its wishes (detrimental to accommodation, which developed unceasingly and always embraced more and more exterior objects); whilst it subdued its impulsive gestures and its affective ideation, it has simultaneously bent them so as to utilise these factors in the pursuit of its aim. The result has been a motility at the disposition of its wish, a memory rich in more and more perfect syntheses, and mechanisms of recall and association which, by their speed and exactitude, have given it a subjective impression which we have called certitude here, which might be found back in other places with other names, as that of intuition, for instance, but which, in my opinion, is inseparable from the happy choice and has ended by becoming consciousness of self. We will return to this particular evolution before the end of this chapter.

I summarise this discussion by saying that it has shown us that all the faculties constitutive of consciousness are traced back to the animal, and that their development is explained by the transitions we have just roughly sketched. These factors are principally: will, memory, the sentiment of the subjective certitude, inhibition or repression.

The mystery around consciousness has gradually cleared from the moment we have succeeded in discovering its object ; afterwards it has sufficed to rapidly follow its more important stages, so that our aim is virtually reached, and the few following remarks are only intended as last touches for the completion of the construction we have succeeded in edifying. However, I shall abstain from developing the subject of the advantages which consciousness brings us, for it belongs more to the domain of descriptive psychology and philosophy, while this study is only from the genetic point of view. I shall begin by remarking that the history of the evolution of our conscious faculties shows us the great uniformity which has not ceased to characterise it : on one part, a unique tendency has brought the mind from unconsciousness to consciousness ; on the other side, the chief constitutive elements are identical at all stages.

The essential difference between unconsciousness and consciousness exists in the degree of development of the mechanisms of choice and of externalisation, perfections resulting from a constant economy of the psychic energy. This difference makes us think of that between the conduct of Little Red Riding-Hood and the Wolf. The latter takes the most direct course ; she wastes time on the way because she scatters her efforts. Therefore, it is not astonishing that W. James should have described consciousness as a " selecting-agency." Primitive unconsciousness has not been anything else.

We have called attention to the fact that the phenomenon, which ancient psychology has described as the passage of the threshold of consciousness, is retraceable in the dog at the moment he becomes aware he may be able to accompany me for a walk. It is also found back in other animals, for instance, the one which, with species living in community, is placed as a sentry to see to the security of the collectivity. Why should not we underline in passing that there are two moments of consciousness accompanied by the emission of spontaneous sounds (barks and cries), for it is to these, perhaps, that

in a near future the origin of language may be yet traced, when the phenomenon of the symbolism of the unconsciousness, of which we know already something through the interpretation of dreams but of which we yet await the complete explanation, will have been studied more deeply? But it is presently the object of researches, and we may foresee the moment where this other mysterious problem will be solved in a definite manner.

* * * * *

I have tried to establish that the first awareness retraceable in the course of evolution is that of the object of adaptation, and that it is also for adaptation that the inferior mechanisms of consciousness continue working when man gives up the use of the most developed faculties of his mind in his renunciation of psychic effort. But next to the comprehension of the aim, man has ended by becoming aware (partially, at least) of the means he brings in operation to reach it. I say partially, because, on one side, we are only aware of our memory for as long as we make use of it to renew a perception in the absence of the object, and very little when we put it to contribution in the act of conception, unless it be during occupations qualified as intellectual. (Ancient terminology hid this participation of memory because of the faculties it has distinguished.) On the other side, the rôle of the affect as creator of syntheses has not been long known to us.

We knew that we were able to think, as Descartes said, but that was all. This meant that, instead of being aware of the aim only, we were also partially aware of the means to be used to reach it. Only we are now also convinced that the fact of becoming aware of this means is not a necessary condition to obtain of it all the advantages it can produce. A synthesis may be elaborated by the ego without being directly provoked by the surroundings and without his becoming aware of it. This is what we call conceiving.

But to trace the evolution of conception we have no

longer any term of comparison with what happens in the animal world. Indeed, in the case of the perception, the animal, from a certain degree of development onwards, executes different sets of movements, which are in such constant and strict relation with the object to be attained, and at the same time of such a nature, that for fifty years no psychologist has hesitated to attribute awareness to the being at the moment where it thus visibly exteriorises the psychic phenomena which take place in its mind. The exterior happenings allow this inference. But when there is a question of conception the problem becomes more complicated. Indeed, in man at least, the whole process of conceptual synthesis may happen without any exterior sign, and if such is sometimes the case with the animal, in the absence of all means of communication between us, the comparison becomes impossible.

However, logic can here in a certain measure supplement observation. We have established previously a criterion of consciousness by concluding: *all operation in which the mind takes part, and which is such as to lead to new adaptation to the surroundings, is capable of becoming conscious.* I am now forced to admit that this manner of formulating my thought is due to a certain hesitation on my part. I have, namely, hesitated to overthrow a little too brusquely all principles admitted up to the present and following which consciousness is inseparable from awareness. But I see, at present, that I have been wrong, and that it would have been better to give vent to my idea directly. Fortunately it is not too late to do so. In my opinion, then, awareness does no more exactly coincide with consciousness than the latter does with intelligence. Intelligence has several aspects, of which consciousness is one. Awareness, in its turn, is but a particular aspect of consciousness. It is its ultimate development with man. If, indeed, consciousness be but intelligence turned towards outer adaptation, it is present in the first organism which no longer reacts with the aid of its reduplicative memory alone, which makes a choice. It would be folly to say that this hypothetical

creature has been aware of the surroundings against which it reacted. Yet by definition it has performed an act of consciousness. Perhaps an analogy will permit me to explain my thought with greater ease : Will being the ultimate development of the vital impulse in passing through wish, vital impulse—wish—will are three principal stages of the tendency towards adaptation. In the same way, I am of opinion that awareness of the non-ego is the development of consciousness, which, by hypothesis, accompanied the first choice. The fleeting consciousness of our ancestors, at a stage corresponding to that of the dog, would be accompanied, when it awakens, by the impression of certitude displayed by the latter. For, I repeat, I cannot doubt that the dog is certain that the circumstance of the family being around a served table may procure him part of the victuals, as he is certain that the whip will bring him a correction, and the apparition of his collar the pleasure of an outing.

In my idea, consciousness remains a constant element throughout the whole of the zoological scale, a state observed by the psychologist judging by certain exterior phenomena. This is the objective data which becomes more and more indubitable as evolution progresses. But for the subject the degree of certitude which accompanies choice grows in identical proportions and assurance is complete, it is a unique whole when choice has become continuous : it is the subjective element. The mind of man, who is perfectly aware of the surroundings, constitutes the development of that of the animal which is aware from time to time, and the latter itself is the evolutive product of a mind where this subjective element but exists at the embryonic state.

But as, following this reasoning, consciousness and awareness are two different things, one element must be able to exist without the other. And, indeed, this is so : we may in full consciousness execute a movement, for instance, of which we are not aware. Of this diverging simultaneousness it would be easy to give several examples, but we will be content with one more : We consciously

perceive, without being aware, the obstacles which we meet and avoid on the road while walking, when part of our attention is absorbed by a text we are reading. I believe that in this way I have proved that my conception is correct, and that a distinction must be made between the state of consciousness, from the objective point of view, and the state of awareness, from the subjective.

This argument equally includes that awareness is concordant with choice, and that it is a faculty which develops in reason of its amplitude.

For the present I will correct my criterion slightly, and say, *is called conscious, all operation in which the mind takes part, and which tends towards a new adaptation to the surroundings.* The faculty of becoming aware follows a parallel development, and results with man in awareness of the aim at first, of the means afterwards, of the ego in the last instance. For what we usually call self-consciousness is after all but a general faculty of awareness which includes the subject as well as the object. With superior animals and with babies, on the contrary, awareness is but directed on the non-ego. Thus, if it is impossible to say in which proportion the superior ape knows he thinks, we may yet imagine, between the ego-object and the ego-subject, certain transitions, which observation of childhood, undertaken from our point of view, would be perfectly capable of reconstituting in an ontogenic manner. Here I suppose, *a priori,* that the child is at first aware that it possesses a memory, and starts from this involuntary ascertaining to treat itself as subject.

What I have still to say of conception at the conscious state is very little. Conscious choice, which is but the perfectioning of the original process, limits itself to the useful (before stopping at the superfluous), and permits us to conceive at the most favourable moment such as the ego understands it to be. Above all, conception has totally freed itself of movement. Abstract thought has even freed itself of the psychic representation of movement. On the other side, it has become, as we said before, a

species of automatism in its turn, always falling back in the same synthesis. The primitive inertia of the mind manifests itself in the repulsion of man to adopt new ones : it is what constitutes his misoneism.

Conscious conception establishes a continual and voluntary link between the ego and the non-ego. But from the moment the non-ego is lost sight of—be it that reduplicative memory makes part of the past unroll under our mental eye, be it that the affective ideation, which does not tend towards the initially-intended adaptation, absorbs mental energy—the link is suppressed. In contradiction with the common phrase " to lose consciousness," I maintain we may lose awareness and still react with a certain degree of consciousness. The function of consciousness, in conception as in perception, is thus to adapt the ego to the non-ego, and distraction is for a normal subject the antithesis of consciousness. When we are distracted it means that the recollections are utilised for a psychic operation which does not aim at immediate adaptation.

Consciousness of self—self-awareness would be more correct—constitutes the ultimate phase of the development we have followed from its origin. It is a state in which the recollection of the influence, which our self may exert on the outer world, is at the basis of all relations we establish with the non-ego. It differs from the awareness of the outer world, which we attribute to superior animals, in that the psychic accent has passed from the object to the conscious subject. This displacement is a phenomenon which has become familiar to us since we have found that (1) conception is a synthesis in which the psychic accent bears on the mind—whereas in perception it carries on the outer world ; (2) wish, and then will, mark the initiative of the ego as definitely taken over from the non-ego. In the case of self-consciousness the ego as cause becomes more important than the non-ego. These successive passages are not lacking in interest. If the metaphor were not too risky, I would say that, thanks to the acquisition of self-consciousness, the rôles

of the ego and of the non-ego have been reversed: if awareness of the ambiance may be represented by a state of indifferent equilibrium, with the ambiance as centre, self-awareness would constitute another state of equilibrium, but with the ego as centre. In other terms, if outer awareness gives warning of the exterior excitations, either useful and capable of awakening a wish—or harmful, and capable of interfering with adaptation—awareness of the self, on the contrary, brings us knowledge of the internal phenomena of the same nature as the foregoing; they are the "psychic qualities" of Freud's definition (cf. p. 224). It allows us also to appreciate our own influence on our psychic apparatus.

It is by starting from philosophical subtleties sooner than from observation that we have thus succeeded in distinguishing self-awareness from outer awareness. However, facts confirm our conclusion. As soon as we had succeeded, at the beginning of this study, in establishing that reduplicative memory is at the basis of the whole psychism, we have tried to prove immediately that it has made anticipation and choice possible at the genesis of mental evolution, and we have proved that the "law of recurrence" was but a particular aspect of the activity of the mind in quest of exterior cause. But this quest of causes, originating with the ego and directed towards the non-ego, has finally ended at the causing ego, the mind has recognised itself, has become certain of itself; that is to say, that self-awareness has equally existed at the embryonic stage in the primitive being from the moment when its mind, having chosen, has become cause. It is obvious that this recognition of self is conditioned by the feeling of subjective certitude which has been examined before, as, indeed, in other psychic phenomena which we have studied.

We might thus say that objective certitude has ended by joining subjective certitude and has combined with it, but that is a question we abandon to philosophers.

It will not be without satisfaction that we find we have thus come back to our starting-point, and that we end

this study in treating finally of the question which has occupied us from the beginning. It is as if we had gone through the complete cycle of mental evolution. But " cycle " is rather a deceiving image. In truth, we have at no moment abandoned our point of departure, and the psychic evolution of man does not constitute so much a cycle as a development around a central point, but following the three dimensions.

We may say, for short, that mental evolution, which has ended at human intelligence, can be described by distinguishing four successive stages, which are all fused together in man :—

Unconsciousness ; Fore-consciousness ; Outer awareness or Consciousness ; and Self-consciousness or—awareness.

Following this conception, unconsciousness and fore-consciousness co-exist from origin. The fore-conscious faculties, then, are those which lead to adaptation. But unconscious and fore-conscious faculties have this in common, that they are both different ways of reacting of the nervous substance. The fore-conscious may be consciousness without awareness, or else may make use of procedures which have never been allowed to cross the threshold.

At the following stage of evolution there is co-existence of the three first states : the stage of outer consciousness is distinctive from fore-consciousness in that it allows the individual to become aware of what goes on around him. Still another difference is the following : the fore-conscious may use both the mental systems which we have designed as conscious and unconscious ; the latter are abandoned in the third state. On the contrary, the fore-conscious and outer consciousness resemble each other by their common tendency towards adaptation.

In man there is co-existence of the four states. Thanks to self-consciousness, he places himself in the centre of creation. We will not come back to the difference between the two last states of consciousness, as we have just examined them. They are easily to be compared, as in both cases awareness is very developed.

The mental diseases teach us that when the last state disappears—or the two last—the more primitive states reappear alone, with all their defects.

I will conclude this chapter by reminding the reader for the last time of the primitive cycle of Baldwin, whose conception has constantly guided us through these pages. For we understand at present why all authors who have treated the subject have insisted on the fact that consciousness is inserted between memory and motility. Memory representing the outside world for the ego, it is as if we said that in the primitive cycle, outer excitation—inner process—motor reaction, the psychic process must be placed between the two extreme moments. At present the fact appears evident, but before we hesitated and were perplexed. But everyone will agree, let us hope, to sum up conscious mental operations as follows: "Outer excitation (which may be replaced by its inner image)—perfected inner process—immediate or put-off motor reaction."

Lastly, I hope to have proved the correctness of Wundt's words: "The ego is a product of development as the whole of man."

CONCLUSION

BEFORE leaving the reader to draw his own conclusion as to the manner in which this essay may have thrown light upon the evolution of the conscious faculties, I take the liberty to summarise the theory expounded in these pages, as follows :—

The mind being the agency which allows the being to react towards the inanimate world, three essential factors have been constantly in the centre of our consideration : the excitations of the ambiance, the vital impulse, and the mental organ which their interaction has developed.

The little differentiated creature strikes us as possessing a general faculty of retention, which is to a certain extent retraceable in inanimate nature, but which has been called here reduplicative memory. It tends to a reproduction which seems to be spontaneous, but which in reality is provoked by outer agents in the first instance and by inner in the second. At the lower stages of mental evolution reduplicative memory is responsible for automatic and reflex behaviour, but it is still of the first importance for the intellections at the top of the ladder. But whereas reduplicative memory represents at all stages—and outside the conscious state—the least mental effort, reversely the greater effort finds expression in different mechanisms, of which an important one is represented by repression, another by synthesis.

Repression inhibits the revivification of reduplicative memory, regulates the mechanism of recall of its synthetical form, is responsible for the separation of thought from movement and for the bridling of the modes of ideation which have been given up in the course of man's history. As I put it, it means the victory of the ego over itself, and can only be conceived as being present

under the name of inhibition at the moment of the first reawakening of the first mnesic element ; for movement cannot be thought of but accompanied by immobility.

Similarly, synthesis is a primary mental function based on reduplicative memory and what we have called the tendency for discovering causes. Therefore the synthetical faculty is also an expression of the greater effort, for the necessity for synthesis can only arise in the case of non-adaptation : full adaptation, on the contrary, develops automatism. The conscious faculties only utilise such syntheses as are turned towards the reaction against the outer world.

But the faculty of retention does not register the exterior only ; it also preserves the inner reactions and their results, so that synthetical memory develops in the same measure as the mind is brought to ever-increasing exertions. At the same time, however, the reduplicative tendency may invade synthetical memory and perpetuate behaviour if the incitement to new syntheses, if non-adaptation is absent.

The presence of memory, synthetical and reduplicative, at the origin, together with movement and vital impulse, is sufficient to explain choice, which takes place whenever accommodation is not reached automatically. But choice includes looking out for the cause in which we have found the primary aspect of consciousness and awareness.

If, now, we consider the primitive mental organ itself, we may take two different points of view. From the standpoint of the non-ego, it is in a passive way a registering apparatus, but as an active agency it is utilised for the observation of causes. From the standpoint of the self, it is the excitant of motility, but as such it may also react with minimal or maximal energy : in the first case, it reveals only an aspect of reduplicative memory, coupled with unconsciousness ; in the second, it uses the mechanisms which we have described as the ones proper to consciousness : the motor system is put in action after a mental operation has been performed, namely, a choice

based on synthesis, consequent upon the awareness of the outer cause.

This description of the mental organ holds good even when we consider the highest exponent of evolution, and we need not alter a word to characterise man's intelligence. However, it does not give a *complete* account of the latter. But over the gulf between the all but complete unconsciousness of the primitive being and the almost continuous conscious state of man there lies a passage that overbridges it: whereas the lower animal is almost entirely dominated by the outer world, man, on the contrary, rules every day more completely his surroundings, or, as written before: the psychic accent has in the course of evolution passed from the non-ego upon the ego, with such consequences as have been described, and of which I recall especially the gradual independence from the objective reality. The degree of this independence, or, if one likes, the relative mastery over the various elements of the surroundings, indicates the place occupied in mental evolution by any individual considered.

But the primitive conditions have always remained the same: as soon as man aims at the exteriorisation of his ideations he must resort to his conscious system.

Further, I might describe awareness as a state of inadaptation during which a choice is proceeding with the aid of the conscious mechanisms. As soon as this awareness, result of the greater effort, is relinquished, the mental operations demanding less energy reassert themselves, and amongst the latter are a few which we have not considered here because they fell beyond the scope of this study; they are, nevertheless, very important for the understanding of abnormality.

At the end of these pages I will communicate a reflection which has come to me, not without surprise, as I became aware of the conclusions to which this study would lead: it is that this theory of mental evolution will, I think, neither be declared Darwinian nor Lamarkian, for it is based at no time on natural selection.

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